THE

JOURNAL OF GAS LIGHTING,

WATER SUPPLY, & SANITARY IMPROVEMENT.

[Registered as a Newspaper.]

Vol. XXIX. No. 736.] LONDON, JUNE 19, 1877. [29th Year.] Price 6d.

RAMSAY'S NEWCASTLE CANNEL COAL. Analysis—12,000 cubic feet of gas per ton of coal; 28-candle gas; coke, 66·70 per cent.; volatile matters, 33·30 per cent. Coke of good quality.

RAMSAY'S PATENT CONDENSED GARESFIELD COKE.

RAMSAY'S ORDINARY GARESFIELD COKE.

RAMSAY'S FIRE-CLAY ARTICLES.

GAS-RETORTS, introduced 1828. FIRE-BRICK WORKS, established 1804. FIRE-CLAY SANITARY PIPES. CHIMNEY-TOPS, and all Goods made of Fire-Clay. The Fire-Clay is worked from Blaydon Main Colliery, is of excellent quality, and no expense spared in perfecting every article. The FIRE-BRICKS (marked "RAMSAY") are to be seen in all parts of the world, and the Works are the most extensive in the Kingdom.

Manufactories—Derwentaugh, Swalwell, and Hebburn Quay, near Newcastle-on-Tyne.

Address G. H. Ramsay, Newcastle-on-Tyne.

GENUINE TORBAY PAINT
AND
SPECIAL GASOMETER PAINT.

Four Prize Medals. Established over 20 Years.

These Paints are now used in 150 Country Gas-Works, and by all the London Gas Companies, on Gasholders, Scrubbers, Purifiers, &c. They will cover tar effectually. Also used by the Admiralty, War Office, Railway Companies, Founders, &c.

They prevent and arrest rust, and protect iron from the action of water, sulphurous and gaseous exhalations.

The covering powers are considerably greater than those of any other Paint.—*See "Engineer," Nov.* 2, 1866.

STEVENS & CO.,
(Successors to Samuel Calley.)
21, GT. WINCHESTER ST., LONDON.
Works: BRIXHAM, TORBAY.

THOMAS PROUD,
BROOKFIELD WORKS,
103, ICKNIELD STREET EAST, BIRMINGHAM.
SPÉCIALITÉ:
THE MANUFACTURE OF
WOOD GRIDS
FOR
SCRUBBERS
AND
PURIFIERS.

COWEN'S PATENT FIRE-CLAY RETORTS.
JOSEPH COWEN and CO.,
BLAYDON BURN, BLAYDON-ON-TYNE,

Were the only parties to whom a Prize Medal was awarded at the Great Exhibition of 1851, for "Gas-Retorts and other Objects in Fire-Clay," and they were also awarded at the International Exhibition of 1862, the Prize Medal for "Gas-Retorts, Fire-Bricks, &c., for Excellence of Quality."

J. C. and Co. have been for many years the most extensive Manufacturers of Fire-Clay Retorts and Fire-Bricks in the Kingdom. Orders for Fire-Clay Retorts of all shapes and dimensions, and to fit any shaped Mouthpiece, Fire-Bricks, and every other article in Fire-Clay, are promptly executed at their Works as above.

COWEN'S GARESFIELD COALS.
Coal Office,
Quay Side, Newcastle-on-Tyne.

Jos. Cowen & Co. are the only Manufacturers of Fire-Bricks and Clay Retorts at Blaydon Burn.

JOHN RUSSELL AND CO.,
LIMITED,
Established at the commencement of Gas Lighting.
Branch Establishments:
69, UPPER THAMES STREET, E.C.;
4 & 5, CHARLES STREET, SOHO;
16, SOHO SQUARE, W.;
48, GREEK STREET, SOHO SQUARE;
83, COMMERCIAL ST., SPITALFIELDS; } LONDON.
35, 36, 37, & 39, GRANBY ROW, MANCHESTER.
16, ELLIS COURT, AIRE STREET, LEEDS.
Manufactories:
ALMA TUBE WORKS, WALSALL, AND
THE OLD PATENT TUBE WORKS, WEDNESBURY.

J. R. & Co., Ld., are the original manufacturers of Wrought-Iron Gas Tubes and Fittings, and Inventors of the LAP-WELDED TUBES for Locomotive and Marine Boilers.

J. R. & Co., Ld., make all kinds of Tubes and Fittings for Gas, Steam, and Water; Gun-Metal Cocks, Stocks, and Dies; Galvanized Tubes and High-Pressure Tubes, &c.

Lists may be obtained on application to
Head London Office:
145, QUEEN VICTORIA STREET.
Head London Warehouse:
234, UPPER THAMES STREET, LONDON, E.C.

JOHN BENT & SON,
BELL BARN ROAD, BIRMINGHAM,
MANUFACTURERS OF
WET AND DRY GAS-METERS,
OF
FIRST-CLASS MATERIALS & WORKMANSHIP;
Also, STATION-METERS, PRESSURE-GAUGES, STREET-LAMPS, REGULATORS, &c.

Established 1830.

THOMAS PIGGOTT & CO.,
SPRING HILL, BIRMINGHAM.
MANUFACTURERS OF
TELESCOPIC & SINGLE GASHOLDERS,
CAST & WROUGHT IRON TANKS FOR DITTO,
And Gas Apparatus of every Description.
Marine, Tubular, Cornish, Plain, Furnace, Saddle, and Range Boilers.
Sugar, Saltpetre, and all kinds of Pans.
Roofs, Girders, and Bridges, and General Smith's Work.
London Agent—W. G. DAVIS, 2, Brabant Court, Philpot Lane, E.C.

J. & H. ROBUS,
BUILDERS AND CONTRACTORS
FOR THE
ERECTION AND REBUILDING OF GAS AND WATER WORKS.
ESTIMATES FREE
FOR MAIN-LAYING AND GENERAL REPAIRS.

RETORT-SETTING A SPÉCIALITÉ.

ROBUS'S IMPROVED RETORT-SETTINGS guaranteed to carbonize a large amount of coal with a small per cent. of fuel.

N.B.—All kinds of Fire Goods, &c., kept in stock for immediate delivery. Orders promptly attended to.

BELL GREEN, CATFORD, S.E.

THE
NITSHILL COMPANY'S
DUKE OF HAMILTON'S
LESMAHAGOW
CANNEL COAL.

AGENT:
JAMES M'KELVIE,
HAYMARKET,
EDINBURGH.

GEORGE GLOVER & CO.

PATENTEES OF THE

NATIONAL STANDARD GASOMETERS

FOR THE ENGLISH GOVERNMENT
AND FOR THE GOVERNMENT OF THE NETHERLANDS
AND OF THE DUPLICATE COPY
Presented by Her Majesty's Government to the French Government,
AND MANUFACTURERS OF

IMPROVED DRY GAS-METERS

Warranted to Measure correctly & not to vary.

RANELAGH WORKS, RANELAGH ROAD, PIMLICO, LONDON, S.W.
236, GEORGE STREET, GLASGOW, & 30, LANCASTER AVENUE, MANCHESTER.

FOREIGN AGENTS.
DAHL BROTHERS, COPENHAGEN. | W. HOVEN & SON, ROTTERDAM.
A. FAAS & CO., FRANKFORT O/M. | COPLAND & McLAREN, MONTREAL.
A. DEMPSTER, 57 ELIZABETH STREET, MELBOURNE.

JOSEPH AIRD,

WELLINGTON TUBE-WORKS, TIPTON, STAFFORDSHIRE,

MANUFACTURER OF

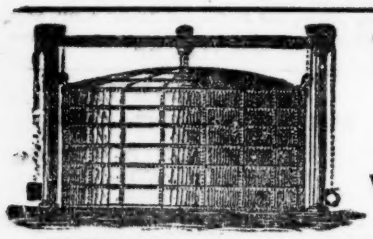
EVERY DESCRIPTION OF TUBING, GAS, STEAM, HYDRAULIC TUBES AND FITTINGS,
EITHER BLACK, GALVANIZED, OR ENAMELLED HOT WATER TUBES AND FITTINGS,
CORE BARS, COILS, COCKS (IRON OR BRASS),
CHANDELIERS, &c., GAS-FITTERS' TOOLS, GAS TONGS, STOCKS, TAPS, DIES, &c., &c.,
HANDRAIL TUBINGS, IRON AND BRASS, PLAIN OR TWISTED,
TELEGRAPH TUBES OR POLES, &c., &c.

LAMBERT BROTHERS, WALSALL.

ALPHA TUBE & FITTING WORKS

Manufacturers of **W. J. WARNER'S PATENT MARKET GAS STAND-PIPE.**

Now ready, **GAS CHANDELIER BOOK (Reduced Prices), 7s. 6d.**



W. C. HOLMES & CO.,

WHITESTONE IRON-WORKS, HUDDERSFIELD

MANUFACTURERS OF

RETORTS, ANNULAR AND PIPE CONDENSERS,
WROUGHT AND CAST IRON SCRUBBERS, PURIFIERS,
GASHOLDERS,

GOVERNORS, AND ALL THE NECESSARY FITTINGS FOR COMPLETING THE ERECTION OF GAS-WORKS.

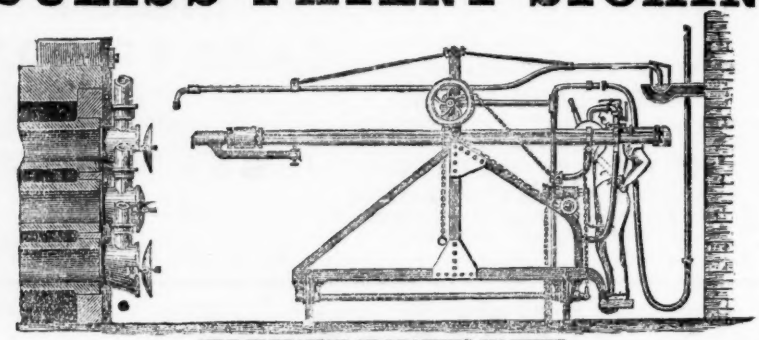
STATION & CONSUMERS WET OR DRY METERS, STREET & SERVICE MAINS, LAMP COLUMNS & BRACKETS, & WROUGHT-IRON TUBES AND FITTINGS; WROUGHT-IRON ROOFS FOR ANY SIZE OF BUILDINGS.

Sole Makers of B. W. Thurston's Combined Condensing, Scrubbing, and Washing Apparatus,
AND PATENTEES OF THE IMPROVED COMBINED CONDENSING AND PURIFYING APPARATUS SO EMINENTLY ADAPTED FOR EXPORTATION.

REFERENCES TO UPWARDS OF 300 GAS-WORKS.

LONDON OFFICES: 92, CANNON STREET.

FOULIS'S PATENT STOKING MACHINE.



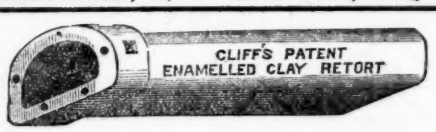
SIDE ELEVATION OF DRAWING MACHINE.

END ELEVATION.

(*The Charging Machine will be Illustrated in next week's Advertisement.*)

Makers: TANGYE BROTHERS and HOLMAN, London and Birmingham; ADAM WOODWARD and SON, Manchester; ROBERT LAIDLAW and SON, Glasgow; MASCHINENBAU-ACTIEN-GESELLSCHAFT HUMBOLDT, Kalk bei Deutz:
Or all particulars may be had from JAMES WOTHERSPOON, 31, St. Vincent Place, Glasgow.

Established



1795.

JOSEPH CLIFF & SONS,

THE ORIGINAL

WORTLEY FIRE-BRICK WORKS,

NEAR LEEDS,

London Wharf: No. 4, inside Great Northern Goods Station, King's Cross, N.;

LIVERPOOL: Back Leeds Street.

SPECIAL NOTICE.—Our Patent Machine-made Retorts have now been in *actual work* nearly 800 days, and are yet in good order. References on application.

WHITEHOUSE AND COMPANY, LIMITED,

GLOBE TUBE-WORKS, WEDNESBURY; & VICTORIA TUBE-WORKS, GREAT BRIDGE, STAFFORDSHIRE,

MANUFACTURERS OF

PATENT WELDED WROUGHT-IRON TUBES,

FOR GAS, STEAM, AND WATER;

GAS-FITTERS TOOLS, STEAM COCKS, AND ALL KINDS OF JOINTS.

HYDRAULIC TUBES, CORE BARS, TELEGRAPH POSTS, COILS, &c.

London Agent—ALFRED LAKEMAN, 9, FENCHURCH STREET, E.C.

AND PARLIAMENTARY APPLICATIONS CONDUCTED

ROBT. DEMPSTER & SONS,

GAS ENGINEERS, IRONFOUNDERS, AND CONTRACTORS,

ROSE MOUNT IRON-WORKS, ELLAND, YORKSHIRE,

MANUFACTURERS OF EVERY DESCRIPTION OF

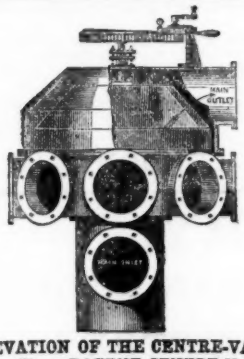
GAS APPARATUS;

CONTRACTORS FOR THE

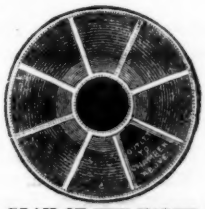
ERECTION OF PUBLIC AND PRIVATE GAS-WORKS.

Plans and Specifications Prepared, and Illustrated Catalogues forwarded on application.

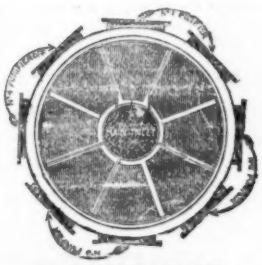
C. & W. WALKERS'
PATENT CENTRE-VALVES.



ELEVATION OF THE CENTRE-VALVE.



PLAN OF THE VALVE.

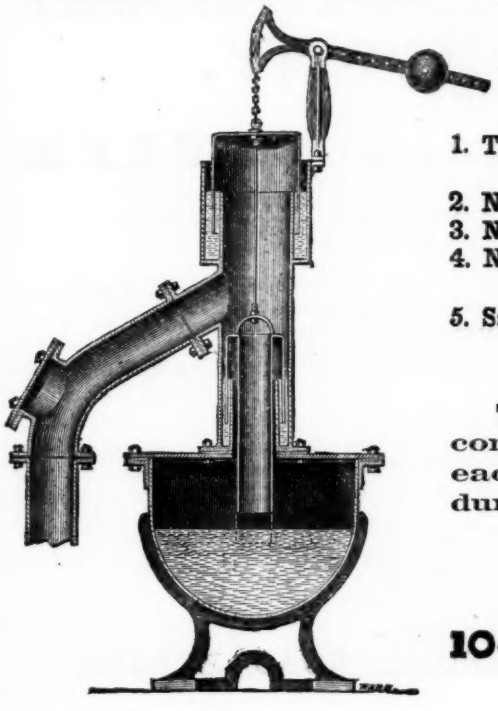


PLAN OF THE BODY.

These PATENT CENTRE-VALVES are the most perfect and certain means for working Purifiers on the system of three in action, and one out of action. The Valve itself is protected from all injury inside the safety cover. The working of the Valve is so easy, and so governed by the stop-catch movement, that the Purifiers can be instantaneously changed in the dark as well as in daylight. They are scraped perfectly true, metal to metal, the facings heretofore exposed are always covered, and there is nothing more reliable, certain, and durable in a gas-works. By their use the floor of the Purifying-house is clear and level; the Valve and all connexions being beneath the floor, out of the way of working. A considerable improvement and saving is effected in the cost of the connecting-pipes.

MIDLAND IRON-WORKS, DONNINGTON, near NEWPORT, SHROPSHIRE; 8, FINSBURY CIRCUS, LONDON.

SELF-ACTING REMOVABLE DIP-PIPE,



PATENTED BY

CHANDLER & STEVENSON.

ADVANTAGES.

1. There is no pressure on the Retorts.
2. No deposit of Carbon.
3. No scurfing is required.
4. Never a choked Ascension-Pipe.
5. Saves Fuel and Wear and Tear.
6. Gets 10 per cent. more Gas out of the Coal, and a higher Illuminating Power.
7. Is never out of order.
8. Requires no attention.
9. Is perfectly automatic in its action.

These Dip-Pipes can now be supplied complete, except the flanched bend, for £4 each, which includes the charge for licence during the whole term of the patent.

Applications to be made to

Messrs. CHANDLER & SONS,

104, NEWINGTON CAUSEWAY, S.E.,

Who fix the Dip-Pipes, at a small Charge, when required.

THE

IMPERIAL METER COMPANY,

LIMITED,

KING'S ROAD, LONDON, N.W.,

OFFICE: 115, VICTORIA STREET, WESTMINSTER, S.W.,

MANUFACTURERS OF

"WET" & "DRY" GAS-METERS IN IRON & TIN-PLATE CASES,

STATION-METERS AND GOVERNORS, STREET-LAMP METERS, BOXES, AND REGULATORS FOR THE AVERAGE METER SYSTEM.

Attention is called to their Dry Meters in Wood Cases, as used by the principal London Gas Companies. These Meters are especially suitable for seaport towns and for export.

The Company repair or convert every description of Wet Gas-Meters to De Castro and Burton's Patent.

EDWARD E. CROMBIE & CO.,

INVENTORS AND PATENTEES

OF THE

FRICTIONLESS DRY GAS-METERS,

Beg to intimate to Gas Companies and others that they are now prepared to supply these very superior Meters at the same prices as for the ordinary Gas-Meters.

In the construction of this Meter, for which the best tin plates only are used, every mechanical contrivance has been taken advantage of successfully to reduce the friction to a minimum, which is amply proved by the fact that they are made to work upon only one-fortieth of an inch pressure. By an improvement also in their construction, a steadier light is obtained, and greater capacity than can be got from any other Meter in the market. No gas can pass under the valves on any back pressure, as is the case with many other Dry Meters.

To Gas Companies supplying gas through streets with heavy gradients, these Meters are invaluable, as much gas is saved from the low pressure required to work them.

ALL METERS ARE UPHELD FOR FIVE YEARS.

METROPOLITAN WORKS, DIANA PLACE, EUSTON ROAD, LONDON, N.W.

FLETCHER AND MURPHY,

GARRATT STREET WORKS, OLDHAM ROAD, MANCHESTER;

Manufacturers of

IMPROVED CONSUMERS WET GAS-METERS

IN CAST-IRON CASES,

THE UNVARYING WATER-LINE GAS-METER,

AND

IMPROVED DRY GAS-METERS;

STATION-METERS OF ALL SIZES, with PLANED JOINTS;

GOVERNORS, PRESSURE AND EXHAUST REGISTERS, TEST HOLDERS.

And all kinds of Experimental Gas Apparatus.

WILLEY & COMPANY,

GAS ENGINEERS,

WORKS: COMMERCIAL ROAD, EXETER,

INVITE THE ATTENTION OF GAS COMPANIES AND OTHERS FOR THE SUPPLY OF

EVERY DESCRIPTION OF GAS APPARATUS.

ENGINEERING DEPARTMENT.

NEW GAS-WORKS erected complete. Plans and Estimates furnished. MAINS, METERS, SERVICES, LAMPS, &c., adapted for Towns of any size. Gas Companies advised on Improvements, Extensions, and Alterations of Works.

GASHOLDERS AND TANKS.

RETORTS and RETORT-HOUSE FITTINGS, CONDENSERS, SCRUBBERS, ENGINES and EXHAUSTERS, PURIFIERS, STATION-METERS, GOVERNORS, VALVES, &c.

METER DEPARTMENT.

They beg special attention to the excellence and superiority of their WET and DRY METERS, several thousand being now in use by many of the largest Gas Companies in the West of England and South Wales. Warranted to measure correctly, and not to vary. Their acknowledged superiority has brought them into general use more rapidly than any Meters hitherto manufactured. A guarantee of Five years tendered with each Meter.

GAS-FITTING DEPARTMENT.

An extensive variety of Choice Designs in CHANDELIERS, PENDANTS, BRACKETS, STAR and SUN LIGHTS, MEDIÆVAL FITTINGS for CHURCHES, &c.

PATTERN-BOOKS and PRICE LISTS furnished.

☞ PLEASE NOTE THE ADDRESS—

GAS ENGINEERING WORKS, COMMERCIAL ROAD, EXETER.

GEORGE ORME & CO.,

ATLAS METER-WORKS, OLDHAM,

MANUFACTURERS OF

WET AND DRY GAS-METERS.

STATION-METERS, GOVERNORS,

PRESSURE AND EXHAUST REGISTERS,

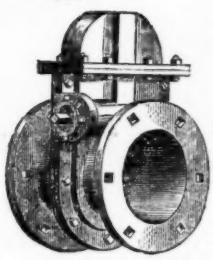
LAMP-METERS IN CAST-IRON BOXES,

And every Description of Gas Apparatus.

B. DONKIN & CO.'S

IMPROVED GAS-VALVES

WITH WROUGHT-IRON PINIONS.



List of prices, with full dimensions of all sizes up to 48-inch, to be had on application.

These Valves are proved on both sides to 30 lbs. on the square inch before leaving the works, and are kept in stock.

ALSO MAKERS OF

J. BEALE'S NEW PATENT GAS EXHAUSTERS,

STEAM ENGINES FOR DRIVING GAS EXHAUSTERS,

VALVES FOR AMMONIACAL LIQUOR,

IMPROVED BRIDGE VALVES FOR REGULATING THE SEAL IN HYDRAULIC MAINS,

BYE-PASS VALVES, &c., &c.

B. DONKIN & CO., 55a, BLUE ANCHOR ROAD, BERMONDSEY, LONDON, S.E.

J. & J. BRADDOCK,

GAS ENGINEERS,

GLOBE METER-WORKS, OLDHAM,

MANUFACTURERS OF

WET & DRY CONSUMERS GAS-METERS,

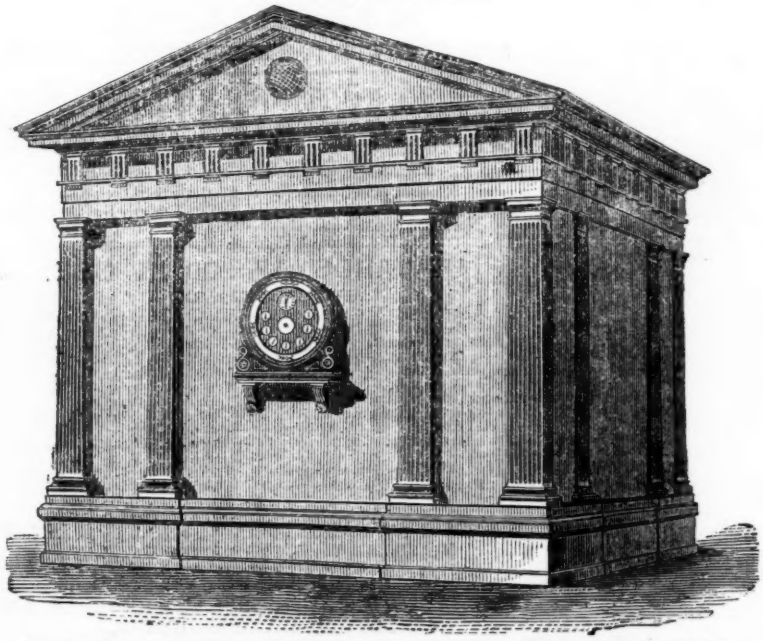
OF THE HIGHEST EXCELLENCE ONLY;

ALSO LICENSEES AND MANUFACTURERS OF

WARNER & COWAN'S PATENT SELF-REGULATING GAS-METERS;

ROUND STATION-METERS,

ON CAST-IRON STANDS.



SQUARE STATION-METERS,

WITH PLANED JOINTS.

GOVERNORS, GAUGES, INDICATORS, MAIN COCKS, &c.

GAS COOKING APPARATUS.

Home and Foreign Orders promptly attended to.

All Sizes of CONSUMERS METERS, STATION-METERS, and GOVERNORS generally in Stock.

Orders almost invariably despatched on the day of receipt.

TERMS, &c., ON APPLICATION.

INTERNATIONAL EXHIBITION, 1862.

CLASS X.

PRIZE MEDAL

For excellence of Fire-Clay Gas Retorts, and "HONOURABLE MENTION" for good quality of Fire-Bricks.

WILLIAM STEPHENSON & SONS,

THROCKLEY,

NEWCASTLE-ON-TYNE.

C. & W. WALKER'S

WOOD PURIFIER SIEVES,

Which have now been used for fifteen years, and their advantages and durability fully established. They are made entirely by steam machinery in very large quantities at the most moderate cost.

MIDLAND IRON-WORKS,

DONNINGTON, NEAR NEWPORT, SHROPSHIRE.

8, FINSBURY CIRCUS, LONDON.

ESTABLISHED IN 1860.

BENJAMIN CARPENTER,

THE ORIGINAL MANUFACTURER OF THE IMPROVED

WOOD SIEVES

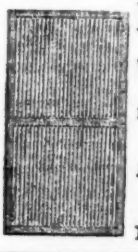
FOR

GAS PURIFIERS & SCRUBBERS.

PROVIDENCE WORKS,

22, HERMES STREET, PENTONVILLE ROAD,

LONDON, N.



DEMPSTER & SONS'

RENOWNED

WOOD SIEVES,

WITH TAPER BARS,

MADE BY MACHINERY

CAPABLE OF MAKING 10,000 FEET WEEKLY.

References to Hundreds of First-Class Engineers.

ROSE MOUNT IRON-WORKS,

ELLAND, NEAR HALIFAX.

CATOPTRIC LAMPS.

The NEW PATTERN

Is now placed throughout CHEAPSIDE.

For Terms of Licence to Use and Manufacture, apply to

Mr. SKELTON,

37, ESSEX STREET,

STRAND.

LAMP-PILLARS,

GAS-LAMPS, FOUNTAINS.

Our New and Choice Designs for the above, with prices, are forwarded to any part of the world on receipt of twelve stamps. Estimates for work at home or abroad.

W. T. ALLEN & CO.,

GAS & WATER ENGINEERS & CONTRACTORS,

SOMERSET BUILDINGS,

LAMBETH HILL, UPPER THAMES ST.

(Late 203, Upper Thames Street), LONDON, E.C.

THOMAS TURTON AND SONS,

SHEAF AND SPRING WORKS,

SHEFFIELD,

MANUFACTURERS OF

FILES OF BEST QUALITY

FOR ENGINEERS,

STEEL OF ALL DESCRIPTIONS,

SCREW STOCKS, TAPS, AND DIES, SPANNERS,

RATCHET BRACES, LIFTING-JACKS,

ANVILS, VICES,

AND ENGINEERS TOOLS GENERALLY.

LONDON WAREHOUSE:

35, QUEEN STREET, CANNON STREET, E.C.

JAMES OAKES & CO.,
ALFRETON IRON-WORKS, DERBYSHIRE,
AND
WENLOCK IRON WHARF, 21 & 22, WHARF ROAD, CITY ROAD, LONDON, N.,
Keep in London and at their works large stocks of PIPES and CONNEXIONS (1¼ to 36 inches in diameter); also make and supply Retorts, Tanks, Columns, Girders, Special Castings required by Gas, Water, Railway, Telegraph, Chemical, Colliery, and other Companies.
CHARLES HORSLEY, Agent.

BIRTLEY IRON WORKS,
CHESTER-LE-STREET, DURHAM.
Manufactory for every description of Casting and Machinery for Gas-Works and Water-Works.
Warehouse in London for Cast-Iron Pipes and Connexions of all sizes and in any quantity, Scott's Wharf, Bankside, Southwark.
Agent in London, Mr. J. MANWARING, 101 Cannon Street, E.C.

THE
SILICA FIRE-BRICK CO.,
OUGHTIBRIDGE,
Near SHEFFIELD,
Manufacturers of THE ORIGINAL SILICA OR DINAS FIRE-BRICKS. Specially adapted for Gas-Retort Furnaces, and for Siemens's Gas-Furnaces. Shipments promptly executed to London, Liverpool, Hull, Grimsby, &c.

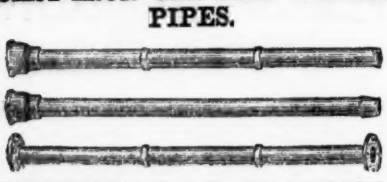
TROTTER, HAINES, & CORBETT,
BRETTELL'S ESTATE
FIRE CLAY & BRICK WORKS,
STOURBRIDGE.
Manufacturers of GAS-RETORTS, GLASS-HOUSE FURNACE & BLAST-FURNACE BRICKS LUMPS, TILES, and every description of FIRE-BRICK.
Proprietors of
BEST GLASS-HOUSE POT and CRUCIBLE CLAYS.
Successors to
E. BAKER AND CO., LATE BRIERLEY HILL, STAFFORDSHIRE.

MOBBERLEY & PERRY,
FIRE CLAY and BRICK WORKS,
STOURBRIDGE.
Proprietors of
BEST GLASS-HOUSE POT and CRUCIBLE CLAY.
Manufacturers for Home and Export.
GAS-RETORTS, GLASS-HOUSE FURNACE, BLAST-FURNACE, TANK BRICKS, LUMPS, TILES,
And Every Description of Best Fire-Bricks.

HARPER & MOORES,
PROPRIETORS OF THE
BEST STOURBRIDGE CLAYS,
STOURBRIDGE.
Manufacturers of all Descriptions of
BEST STOURBRIDGE FIRE-BRICKS, LUMPS, AND CLAY RETORTS
Of all Dimensions for Gas-Works,
GLASS-HOUSE POTS & CRUCIBLES
Of every kind.
The Highest Award was obtained by H. & M., at the Philadelphia Exhibition, 1876, for Superior Quality of Manufacture.

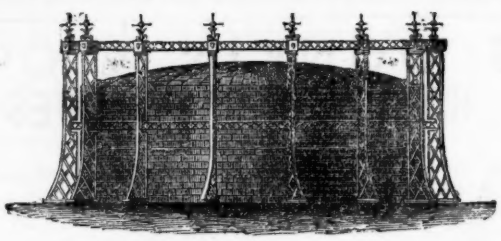
"SELLARS' CEMENT"
PREVENTS WASTE OF GAS FROM RETORTS;
SAVES CLAY RETORTS FROM DESTRUCTION BY FIRE;
GREATLY ECONOMIZES THE USE OF FIRE-BRICKS;
And PREVENTS ALL POSSIBLE LOSS of GAS FROM LEAKAGE.
J. C. SELLARS,
THE GAS CEMENT WORKS,
BIRKENHEAD.

GAS AND WATER PIPES.
WILLIAM MACLEOD & CO.,
23 & 25, OSWALD STREET, GLASGOW.
CAST-IRON GAS AND WATER PIPES.



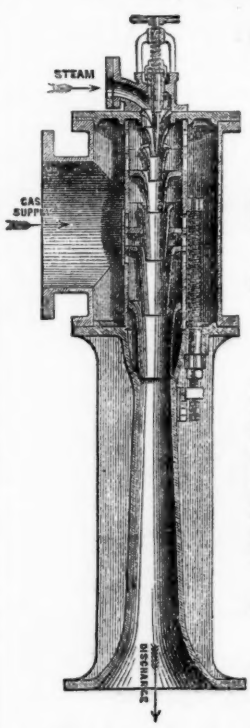
DELIVERY F.O.B., GLASGOW.
Prices on application.

ALFRED WILLIAMS,
PHŒNIX FIRE-BRICK WHARF,
64, BANKSIDE, SOUTHWARK, LONDON, S.E.
ENGINEER AND CONTRACTOR FOR THE ERECTION OF GAS-WORKS,
AND FOR THE
SUPPLY OF RETORTS, FIRE-BRICKS, CAST-IRON MAINS,
AND ALL MATERIALS FOR GAS MANUFACTURE AND DISTRIBUTION.



THE HORSELEY COMPANY,
LIMITED,
TIPTON, STAFFORDSHIRE.
LONDON OFFICE:
6, WESTMINSTER CHAMBERS, VICTORIA STREET,
GAS ENGINEERS, IRONFOUNDERS, &c.,
MANUFACTURERS OF
GASHOLDERS, WROUGHT AND CAST IRON TANKS, CONDENSERS, PURIFIERS, SCRUBBERS, MAINS, RETORT-LIDS, PLAIN AND DISHED, LAMP-POSTS, PIPES,
AND ALL REQUISITES FOR EITHER
GAS OR WATER WORKS;
ALSO
MAKERS OF ROOFS, BRIDGES, &c.

KÖRTING BROS.,
Steam-Jet Engineers,
7 and 17, LANCASTER AVENUE,
MANCHESTER,
AND 40, LOWER GARDINER STREET, DUBLIN.



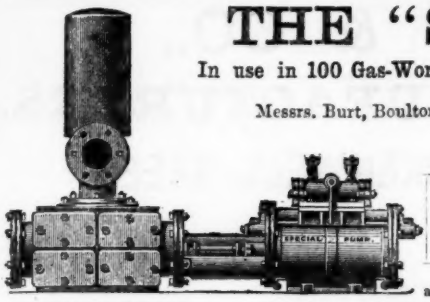
E. KÖRTING'S PATENT
STEAM-JET GAS-EXHAUSTER.
IMPROVED CLELAND'S PATENT.
Small Cost—Compactness—Perfectly Self-Acting—
Self-Regulating—Self-Cleansing—No Steam-Engine—No Attention—
No Extra Room Required—No Wear and Tear—No Noise—
No Oscillation in Vacuum, or Back Pressure.
UPWARDS OF 200 IN USE.
SUPPLIED TO—

Chartered Gas Co.	Glasgow Corporation.	Hanna, Donald, and Wilson, London.
London Gas Co.	Leyland Gas Co.	Ratcliff Gas-Works.
S. Metropolitan Gas Co.	Stalybridge Gas-Works.	Kendal Gas-Works.
Phœnix Gas Co.	Lincoln Gas-Works.	Longton Gas Co.
Liverpool Gas Co.	Birmingham Gas-Works.	Dartford Gas Co.
Bolton Corporation.	Wakefield Gas-Works.	Exeter Gas Co.
Horsham Gas Co.	Brentford Gas-Works.	Harrogate Gas Co.
Epsom and Ewell Gas Co.	Burnley Gas-Works.	Hertford Gas Co.
Ipswich Gas Co.	Guildford Gas-Works.	Waterside Gas-Works, Todmorden.
Cheltenham Gas Co.	Gloucester Gas-Works.	F. W. Grafton and Co., Accrington.
Sandwich Gas Co.	Kirkintilloch Gas-Wks.	
Cornholme Dis. Gas-Wks.	Nantwich Gas-Works.	
Bury Gas-Works.	Enniskillen Gas-Works.	

&c., &c., &c.

E. KÖRTING'S PATENT STEAM-JET REVIVIFYING BLOWERS FOR THE PURIFYING MATERIAL.
SOLE LICENSEES FOR
W. CLELAND'S PATENT STEAM SCRUBBER AND SLOW-SPEED CONDENSER.
FOR PARTICULARS, APPLY TO
KÖRTING BROS., 7 and 17, Lancaster Avenue,
MANCHESTER,
and 40, Lower Gardiner Street, Dublin,
OR TO
GERALD J. TUPP, 8, John Street, Adelphi, W.C.,
LONDON,
SOLE AGENT FOR ENGLAND AND WALES.

THE "SPECIAL" STEAM-PUMP.



In use in 100 Gas-Works in the United Kingdom for Pumping Ammoniacal Liquor, Water, or Tar.

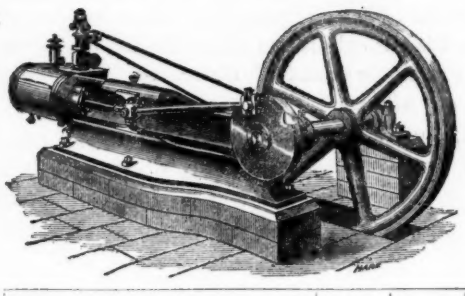
Messrs. Burt, Boulton, and Haywood, Manufacturing Chemists, have FORTY "Special" Steam-Pumps in use at their several large Tar-Works.

200 Sizes made. The following are the Leading Sizes for Gas-Works:—

Steam Cylinder . . . in.	3	4	3	5*	5*	4	6*	5	7*	6	8*	7	10*
Water Cylinder . . . in.	1½	2	3	2½	3	4	4	5	5	6	6	7	7
Gallons per hour . . .	450	815	1830	1250	1830	3250	3250	5070	5070	7330	7330	9750	9750
Price	£16	£18	£18	£21	£22½	£25	£30	£32½	£40	£40	£50	£50	£65

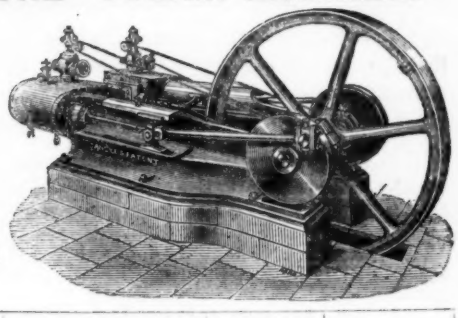
* These Sizes being usually selected for pumping Tar and Liquor, are always in stock, or nearly ready, fitted with all pump details in iron, and extra length distance-piece between steam and pump cylinder, at a small extra cost.

TANGYE'S HORIZONTAL HIGH-PRESSURE STEAM-ENGINES.

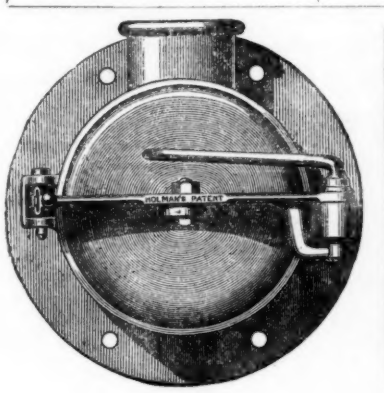


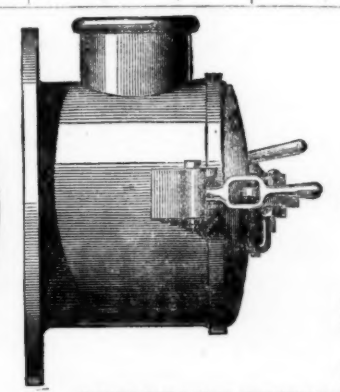
THE DESIGN,
WORKMANSHIP,
AND
LOW PRICE
OF THESE ENGINES
HAVE CALLED FORTH
UNIVERSAL APPROVAL.

Over 2000 Sold
Since December, 1869.



SIZE	B	C	D	E	G	H	I	J	K	M
Nominal Horse Power	TWO	THREE	FOUR	SIX	EIGHT	TEN	TWELVE	FOURTEEN	EIGHTEEN	TWENTY-FIVE
Price of Engine, with Governor . . .	£28 0	£38 0	£46 0	£70 0	£90 0	£115 0	£127 0	£140 0	£195 0	£220 0
Feed-Pump, extra.	3 0	3 15	4 0	5 10	6 0	7 10	7 10	8 0	10 0	15 0
Variable Expansion Gear, extra . . .	..	..	..	..	13 0	14 0	15 0	15 0	20 0	25 0





MORTON'S
Patent Self-Sealing
RETORT LIDS,
WITH
HOLMAN'S NEW PATENT BRACKETED CROSS-BARS, ANTI-FRICTION CATCHES, AND ECCENTRIC FASTENINGS.

Instantaneous Sealing effected. No Luting. No Duplicate Lids required. Holman's New Self-Sustaining Cross-Bar ensures freedom of joint, and maintains parallel position of the Lids.

Since their introduction in 1869, these Patent Retort-Lids have been thoroughly tested (rigid cast iron is now successfully employed), nearly 25,000 being in use at various Gas-Works in London and the Provinces.

IMPORTANT TESTIMONIAL.

The Gaslight and Coke Company (commonly called the Chartered Gas Company), Beckton, North Woolwich.

Gentlemen,—In answer to your inquiry respecting the Self-Sealing Lids, I beg to say that they continue to work well, and I have every reason to be satisfied with them. I should be very sorry to return to the old system of Luting, and our stokers here freely acknowledge the benefit to them of the new system.

I am, yours truly, (Signed) G. C. TREWBY.

HUNT'S PATENT EQUILIBRIUM GAS-GOVERNOR.

In this Governor a Throttle-Valve is substituted for the ordinary suspended Cone, all external communications being avoided by placing the Lever or Radius Arm (shown in the drawing) inside the Valve-Chamber upon the Disc. The Disc is carried upon steel centres, upon which it is accurately balanced and turns freely. The friction in working is thereby reduced to a minimum. This Governor is extremely sensitive to alterations of inlet or outlet pressure, and renders a large actuating holder unnecessary.

The principal advantages of this arrangement over the ordinary form of Governor are as follows:—

Its sensitive action prevents oscillation.

It is self-adjusting—*i.e.*, it maintains a steady pressure under variations of inlet pressure or a fluctuating consumption.

The inlet to Gasholder being contracted to the smallest possible dimensions, all danger from leakage through insufficiency of seal, tilting, &c., is entirely avoided.

The valve portion being separate from the holder, it can be handled and fixed like an ordinary Slide-Valve direct in the main; and the holder can be placed at any convenient distance immediately above it. The cost is thus materially reduced, and the inconvenience of heavy lifts done away with.

There are no working parts likely to get out of order.

These Governors have been adopted by many leading Gas Companies, among whom are the following:—

The Gaslight and Coke Co. (9), The London Gas Co. (3), and at Abergavenny, Arundel, Birmingham, Cannes (France), Devonport, Dronfield, Dursley, Exeter, Guernsey, Mentone (France), Monmouth, Newcastle-on-Tyne, Oxford, Plymouth, Rochdale, Windsor, &c.

TESTIMONIAL.

The Gaslight and Coke Company,
9, Water Street, New Bridge Street,
Blackfriars, E.C., Feb. 27, 1875

MESSRS. TANGYE BROTHERS AND HOLMAN.

Gentlemen,—The two 24-inch and three 36-inch Hunt's Equillbrium Governors supplied by you, and fixed in the valve-rooms at Whitechapel, Goswell Road, and Blackfriars, are working very satisfactorily.

Yours tru'y,

(Signed) JOHN JOHNSON.

PRICES AND FULL PARTICULARS ON APPLICATION TO

TANGYE BROTHERS & HOLMAN,

SOLE MANUFACTURERS,

LAURENCE POUNTNEY LANE, LONDON, E.C.

THOMAS GLOVER & CO.,

DRY GAS-METER MANUFACTURERS,

214 TO 222, ST. JOHN STREET, CLERKENWELL GREEN,

LONDON, E.C.

TO GAS ENGINEERS AND MANAGERS.

It having come to our knowledge that a report is in circulation, spread by some unprincipled person or persons, that the cases of our larger-sized Meters are made of Galvanized Iron, we think it only fair to ourselves, and just to our customers, to say, that we never have used, in making any of our Meters, a single pound of *Galvanized Iron*, or any other *cheap* and *inferior material*, and this can be easily seen by opening any of them.

The cases of our large-sized Meters, from 20 lights and upwards, are all made of the very *Best Best Patent Alloy*, which is nearly double the price, and will last more than double the time, of some other material that has been and still is very largely used for the same purpose. And our experience, acquired by an extensive use of it for upwards of 30 years, enables us to say with confidence that no other metal in use for the purpose is so little liable to corrosion from the action of the gas.

We have now in use a Meter made in 1848, and therefore 29 years old, the case of which is made of Patent Alloy; the Meter is still in perfect order, and shows no signs of decay.

The utmost care is exercised by us in selecting none but the very best materials for all parts of our Meters; much of it is made *expressly for us*, as it is not possible to obtain it in the open market of the same superior quality.

The great fall in the price of all materials used in making our Meters has enabled us to give an increased discount, thus giving our customers the benefit of the fall. This we were bound in fairness to do, as we raised the price of our Meters four years ago, when the price of all metals went up.

It will be our constant endeavour, by using none but the best materials, and employing the most skilful workmen, to maintain the high character our Meter has hitherto borne.

WILLIAM PARKINSON & CO.

(SUCCESSORS TO SAMUEL CROSLEY,)

COTTAGE LANE, CITY ROAD, LONDON, E.C.

Established 1816.

MANUFACTURERS OF PATENT

WET & DRY GAS-METERS,

STATION-METERS WITH PLANED JOINTS,

GOVERNORS, PRESSURE REGISTERS, GAUGES,

AND EXPERIMENTAL APPARATUS,

STREET-LAMP METERS,

AND REGULATORS FOR AVERAGE METER INDICATION.

METERS FOR MEASURING WATER.

CONTENTS.

Circular to Gas Companies:— PAGE
Meeting of the British Association of Gas Managers . . . 969
Inaugural Address of Mr. Spice . . . 969
Does Mr. Gladstone Approve of the Transfer of Commercial Undertakings to Municipalities? . . . 970
Estimation of Ammonia in Gas Liquor . . . 970
Reduction of the Price of Gas in Rochdale and Perth . . . 970
The Coal Contracts of the Corporation of Leeds . . . 970
The Corporation of Birmingham *v.* Allen and Another . . . 970
Liability to Income-Tax on Profits Expended Abroad . . . 970

Water and Sanitary Notes:—
A Metropolitan Public Health Bill . . . 970
The Consequences of Duplicate Authority in Salford . . . 970
Metropolis Floods Prevention Bill . . . 970
Southwark and Vauxhall Water Company and the Richmond Vestry . . . 970

Communicated Articles:—
On the Valuation of Gas Liquor . . . 971
The Boring at Messrs. Meux's Brewery . . . 972

Correspondence:—
Mr. Gladstone on the Transfer of Gas and Water Works to Corporations . . . 973
Carbonating Foul Lime . . . 973
Meeting of the British Association of Gas Managers . . . 973

Parliamentary Intelligence:—
Progress of Bills in House of Lords . . . 973
Progress of Bills in House of Commons . . . 973
Waterford Gas Bill . . . 973
Public Health (Metropolis) Bill . . . 974

Legal Intelligence:—
Supreme Court of Judicature—Court of Appeal—Atkinson *v.* The Newcastle and Gateshead Water Company . . . 974
High Court of Justice—Exchequer Division—Imperial Continental Gas Association, *Appellants*, *v.* Nicholson, *Respondent* . . . 974
Chesterfield Police Court—Conviction of a Water Company for Illegally Cutting off Supply . . . 975

Miscellaneous News:—
Glasgow Water Supply . . . 971
Blackpool Corporation Gas Supply . . . 971
Weston-super-Mare Public Lighting . . . 972
Birmingham Water Supply . . . 975
Presentation to Mr. W. H. Hollingshead . . . 975
Metropolis Water Supply . . . 975
Trade Reports . . . 975
Lighting by Electricity . . . 977
Meeting of the Southwark and Vauxhall Water Company . . . 978

SUPPLEMENT.

Parliamentary Intelligence:—
House of Commons Committee—The Gaslight and Coke Company Bill . . . 997

Miscellaneous News:—
Ashbourne Gas Company and the Local Board . . . 1004
British Association of Gas Managers . . . 1004

Register of New Patents:—
Applications for Letters Patent . . . 1008
Patents which have become void . . . 1008

TO CORRESPONDENTS.

No notice can be taken of anonymous communications. Whatever is intended for insertion, must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.

THE JOURNAL OF GAS LIGHTING,

WATER SUPPLY, & SANITARY IMPROVEMENT.

TUESDAY, JUNE 19, 1877.

Circular to Gas Companies.

THE Annual Meeting of the British Association of Gas Managers is naturally, to us, one of the chief events of the year; for, although we fully recognize the value of the services rendered to our art by the younger and smaller Associations, it is in the larger and parent gathering that most interest centres. We have before mentioned our regret that circumstances, which all will understand, do not allow of a longer meeting, and a more general attendance of managers. We should, for example, have been glad if some of our Scottish friends, who have experimented with Aitken and Young's process, had been present, so that we might have had the process discussed from what we may call a southern point of view. Until, however, Mr. Hartley has succeeded in convincing Directors of Gas Companies and others that the attendance of their managers at these gatherings is advantageous to their interests, we fear we shall have to put up with short meetings and limited attendances. We speak, of course, in a general sense, and it must not be considered that we deem the attendance at the late meeting as "limited." It was, on the contrary, larger than was anticipated, and the meeting was as successful as most in the annals of the Association.

The President for the year, Mr. R. P. Spice, was, of course, perfectly at home when addressing an audience of Gas Managers, and it is hardly necessary to say that his opening speech gave the greatest satisfaction to the members. At the commencement of his address he touched on a point which it was necessary to handle with some delicacy. The relations of Gas Companies and Gas Managers to the general public is an important matter to consider. A monopoly, as Mr. Spice very properly put it, is always obnoxious to the public mind, and for this reason, when no other exists, a feeling of distrust and antagonism is created. It follows that, for the successful management of a monopoly, outside the financial part of the business, some special qualities of mind and manner are required. The mind can be easily formed by any one who will follow the President's advice, and adopt a liberal course of reading, which some may think beyond a Gas Manager's requirements, but we believe would prove of essential service to the younger members of our profession. The possession of knowledge, coupled with a faculty for communicating it, is the most valuable gift a man can have. "Knowledge is power," but knowledge in a man's brain may be like steam in the boiler—of no use without the machinery to transmit and distribute it. And here we may remark on the opportunities these meetings afford for acquiring that faculty for communicating information. The production of a paper, and engaging in the discussion which follows the reading of it, constitute a most valuable form of education. A lecturer also informs himself while teaching his audience. We are, therefore, glad to see the number of lecturing Gas Managers extending, and hope to see them still further increase; for it is within our own experience that, where Gas Managers are most in contact with consumers, there the greatest contentment exists. We have seen an intelligent new Manager, with a conciliatory and liberal spirit, restore a large town, with complaining local authority and dissatisfied consumers, to peace and contentment within a few months, a very substantial addition to the dividend of the Gas Company following in the natural course of events. We may refer to this matter again when we come to notice the able paper read by Mr. W. H. Bennett, on the "Means of Extending the Use of "Gas and Coke, and How their Consumption may be Increased," and may pass to Mr. Spice's review of recent gas legislation. It is a source of unmixed satisfaction to us, and must be to all interested in gas and water enterprise, that the career of confiscation, which it was thought was inaugurated by the success of the Stockton and Middlesbrough Corporations last year, has been stopped—at all events, for the present. In this session of Parliament, and up till now, no attempt to make a compulsory purchase of a Gas or Water Company has been successful. Still, we have had to submit to what we may regard as hostile legislation in the shape of a new Standing Order. Mr. Spice appears to believe that this Order, which compels the introduction of auction clauses and the sliding scale into all Gas Bills, will work beneficially for Gas Companies and Consumers. We do not think so, and believe that their effects might easily be neutralized; but we shall not counsel opposition to the spirit of recent legislation. We leave the question to be settled by time and experience, with the simple remark that if it should prove advantageous to Gas Companies, we can only expect renewed agitation. The President truly states, as we have often done in these columns, that the great cause of the warfare between Local Authorities and Gas Companies has always been the success of these latter. It is the ten per cent. dividend that excites the cupidity of Corporations.

We shall not follow Mr. Spice in his remarks on trades unionism, nor shall we, to-day, refer to the great sulphur question which has so recently been discussed, further than to express a general agreement with Mr. Spice in the opinion that the efforts of managers should be directed towards the completion of purification in scrubbers or washers. And here we may conclude a notice of a very interesting and valuable address, making only one additional observation. We are pleased to notice that Mr. Spice did not skim the cream of novelty off the communications to be read, by giving the substance of them before they were made to the meeting.

We shall publish the papers read at the meeting, and the discussions, as fast as our space will allow, and now only make a remark or two on some proposed alterations in the constitution of the Association. There would appear to be some who advocate a certain amount of exclusiveness among the members. We cannot help thinking that this is a mistake. In our opinion, as wide a net as possible should be spread, to bring every one at all interested in, or connected with, gas or gas matters into the Association. Differential rates of subscription may very properly, in certain cases, be insisted upon, considering the primary object of the institution. The fact is before us, that the Association wants money, and as we think more funds are desirable for the increase of its usefulness, we hope the Committee, who have now to consider the question, will see their way to remove every restriction on the admission of all gentlemen who desire entrance to the Association. While we heartily wish that there may be few demands on the Benevolent-Fund, we rejoice to see that it has already reached the respectable sum of £838. This is a very excellent beginning, and we hope the amount will rapidly be added to. It only remains to add that the

dinner and the excursion went off with all the *éclat* that good fare, lively speeches, and lovely weather could ensure.

We may candidly say that we do not like officious friends; still, we can hardly blame Mr. Arthur Silverthorne for transmitting the remarks we casually made on Mr. Gladstone's Birmingham speech to that gentleman, and asking his opinion on the matter to which we drew attention. We do not think that the post-card reply received by our correspondent from the ex-Premier will much help him in his hostile designs against Gas Companies. Mr. Gladstone's answer is cautious, if not evasive. He has evidently given little consideration to the matter respecting which he was interrogated; but we may admit that his views are clearly expressed on one point. He looks with jealousy on the conduct of commercial undertakings by Local Authorities; but in order to ensure economic management, he is in favour of concentration. From that point of view only, he approves of the proceedings at Birmingham, and would endeavour to apply similar principles to London. Now, the principle of concentration, in order to ensure economic management, is what we have always advocated. We may leave the case of Birmingham out of consideration, for the Gas Companies there are past and gone. But we may very properly, in connexion with this correspondence, call attention to a matter which has for some time dropped out of notice, and that is the complete amalgamation of the Metropolitan Gas Companies. Mr. Gladstone's argument, if we may so call it, goes no further than this, that concentration of management is desirable for the sake of economy and public convenience. This can be effected as well by amalgamation as by sale of the undertakings to an authority, if there was one in a position to make the purchase. We hope the Companies will take the hint conveyed on this post-card communication.

We need not say much about Mr. Silverthorne's letter to Mr. Gladstone, but we may remark that, if he advised the Corporation of Hanley, in their proceedings this year, he has been singularly unfortunate, With regard to the other cases mentioned and referred to as compulsory purchases, we must protest that to only one—the Stockton and Middlesbrough Water Company—can the term be accurately applied. All the others were compromises. It is useless now to speculate on what would have been the result of a hotly-contested fight, carried, if necessary, from one House of Parliament to the other; but we must protest against the statement that the Birmingham purchases, even that of the Water Company, were in any sense compulsory. It is important to point out this distinction, in order that the cases may not be quoted as precedents, though we are certain that no parliamentary advocate would do so.

We publish to-day a "Communicated Article" on the subject of the Valuation of Ammoniacal Liquor, which, for reasons that need not be mentioned, describes a process identical with that detailed in the pamphlet by Mr. F. W. Hartley, noticed by us last week. We may mention, however, that Mr. Hartley's pamphlet contains a criticism of the older modes of valuation, which Gas Managers will do well to study, and also gives precise directions for the preparation of the standard solutions to be used in the new. It must be remarked, that the preparation of standard solutions which can be thoroughly relied upon requires great care; and a Gas Manager, who is not a skilled chemist, would do well to purchase them. The apparatus figured in our present number is essentially identical with that described by Mr. Hartley, and is all that can be desired for the successful employment of the new process.

The report of the meeting of the Rochdale Town Council was received too late for notice in our last issue. Our readers will have seen that it has been decided to reduce the price of gas fivepence per 1000 feet. This will absorb £4000, leaving an estimated net profit of £5000 to be carried to the borough-fund account. We cannot help thinking that, with such profit, the price of gas might have been still further reduced for the benefit of the consumers.

The Corporation of Leeds have just made their coal contracts, but only, it would appear, for one year. The price of coal ranged from 5s. 6d. to 9s. 7d.; and that of cannel from 10s. 10d. to 15s. 6d. The average price is 2s. 6d. per ton less than last year, so a reduction in the price of gas is expected to be made immediately. Threepence per 1000 feet is generally anticipated, but some sanguine people speculate on sixpence. The Perth Gas Commissioners have reduced the price of gas fivepence per 1000 feet.

The Corporation of Birmingham, some time ago, brought an action against the proprietors of a colliery in the neighbourhood of the gas-works at Swan Village, to restrain the parties from working their mine so as to cause subsidence of the surface, and to recover damages for injuries already sustained. After a long hearing, the action was dismissed with costs, and the defendants then made a claim for the loss sustained on account of the stoppage of their workings. Upon inquiry, Mr. Roupell assessed the damages to which the defendants are entitled at £2042.

A judgment of much importance to Companies having their seat and origin in this country, but doing business abroad, was given in the Exchequer Division of the High Court of Justice last week. The Imperial Continental Gas Association claimed exemption from income-tax, in respect of such portions of their profits as were retained on the Continent to meet the exigencies of their business. The Court, however, decided that the whole profits of the Company were assessable, and gave judgment for the Crown accordingly.

Water and Sanitary Notes.

A FORTNIGHT ago the Local Government Board unexpectedly introduced a Bill to amend and consolidate the Acts relating to Public Health, which concern the Metropolis. The number of these, though not large, is sufficiently perplexing, and a very useful service will have been rendered when the eleven Acts have been consolidated into one statute. It must, we fear, be confessed that the Sanitary Acts have not been enforced by the Vestries and District Boards with the vigour that was expected of them. We may say, however, that they have often acted with a wise discretion when they have refused to take proceedings on the complaints of squeamish, and it might be spiteful, neighbours, and on sensational reports by their Medical Officers of Health. As a matter of course, this Bill is another step in the direction of centralization—that is, it will, in certain cases, transfer the powers of the Local Authorities to the Central Board. Thus, if a Vestry or Local Board neglect, or refuse, to take proceedings, on complaint being made of a nuisance, the Local Government Board may authorize any police officer in the district to take action, at the expense of the Local Authority. We cannot say that we approve of this provision, which would, unless the Local Government Board investigated every case of complaint, give rise to a great amount of vexatious litigation. There would thus be a double tribunal, occasioning the expenditure of much trouble and cost. We shall not to-day give any further consideration to the Bill, the provisions of which will presently be discussed by all our District Boards, but shall wait to gather and reflect upon the opinions expressed.

If any further illustration of the evils of divided authority were required, one is to be found in recent proceedings in the borough of Salford. There, it would seem (the case is not *unique*), the Corporation and the Board of Guardians both exercise certain sanitary powers. It has recently been discovered that additional hospital accommodation was required for patients afflicted with infectious diseases. The Corporation have a hospital, which was capable of extension. But the Board of Guardians thought they would have a hospital of their own. They therefore proceeded to acquire a site, and erect the building, at a cost to the ratepayers of £22,000. When, however, the building was completed, it was suddenly discovered that the position afforded no practical outlet for the drainage. Thus, it has been found necessary to abandon the site, which, the guardians having demonstrated to be unsuitable for building purposes, will have to be disposed of at a greatly depreciated price. The result has been that an arrangement, which ought to have been made in the first instance, has been completed, and pauper patients will be admitted to the Corporation hospital. In the meantime, the pockets of the ratepayers have suffered very considerably, and all on account of that division of authority which is one of the most pressing evils of these times.

The Select Committee of the House of Commons, who have for nine days had under their consideration the Metropolis Floods Prevention Bill, have reported that, in their opinion, the necessary work should be done by the Metropolitan Board of Works, and paid for by means of a rate levied all over the metropolitan district. This we have all along contended for. It is quite true that Hampstead, Highgate, and Brixton do not directly suffer from the floods as Lambeth and St. Olave's do; but a really metropolitan question is involved, and it should be dealt with in a metropolitan spirit. The Committee was adjourned until to-morrow, to give the Metropolitan Board time to consider what course they would pursue under the circumstances. We hope we shall learn that the Board have accepted the situation, and will proceed with the Bill, amended according to the terms of the Committee's report.

As we expected would be the case, the shareholders of the Southwark and Vauxhall Water Company received from the Chairman a full statement of the relations of the Company with the Richmond Vestry. We express an opinion at once that the

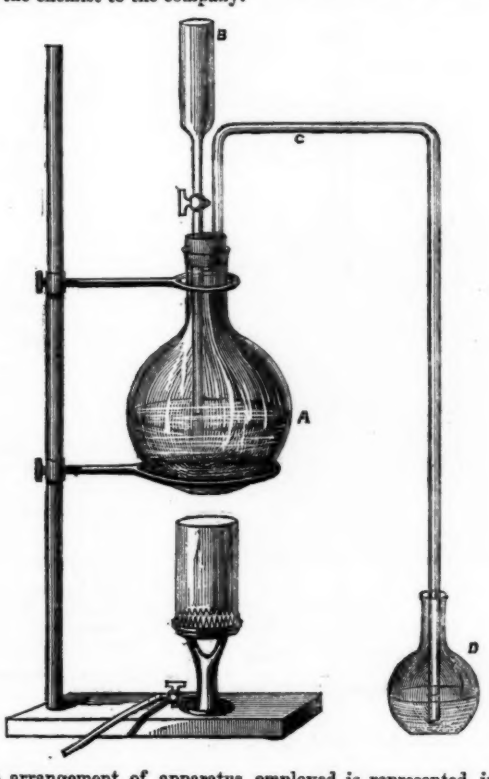
story told by the Chairman is a complete justification of the acts of the Company. It was clearly the design of the Vestry to get water supplied to Richmond for several months without paying for it. On the 3rd of January the Vestry issued a circular to the inhabitants, stating that they were at that date ready to furnish a full supply. On the night of the 13th, ten days later, the Company cut off their supply, and the Vestry had not a drop of water to distribute. The inhabitants of Richmond will not soon forget the Saturday and Sunday that followed. The Vestry had reckoned without their host, and thought that the supply to Richmond could not be stopped without cutting off the supply to Petersham and Kew as well. In this they were deceived; and Richmond was waterless, while the other districts were satisfied. The altered conditions of the supply to the town are worthy of remark, and must be severely felt. The Water Company furnished a daily supply of 1,200,000 gallons, for which they received about threepence per 1000 gallons, producing very little profit, if not involving an absolute loss. The Vestry make it rather a boast that they are supplying 250,000 gallons per day. We need not refer further to the matter. The ultimate failure of the scheme of the Vestry we regard as certain. It will, in the end, cost the ratepayers a large sum of money—much more than is dreamt of at present; and in the result we confidently expect that the Southwark and Vauxhall Company will again be in possession of Richmond.

Communicated Articles.

ON THE VALUATION OF GAS LIQUOR.

The knowledge of the presence of the so-called "fixed ammonia" in gas liquor—that is, of ammonia in a form not indicated by the ordinary acid test—has long necessitated the introduction of a more correct method of valuation, by which the whole of the ammonia contained in the liquor, irrespective of the form in which it is present, should be capable of direct estimation. The process which would almost naturally suggest itself to any one conversant with the subject would be distillation with an alkali, and this method is, in fact, the only practicable mode of obtaining *the whole* of the ammonia from gas liquor in a form which admits of its being directly estimated.

The object of the present article is to describe a form of apparatus which appears to be the simplest distillation process which could possibly have been contrived—a process in which the facility of manipulation renders it possible of accurate performance by any ordinary workman of average intelligence, and in this wise, therefore, as applicable to the desired purpose as the old and erroneous method of valuation by the employment of test acid, applied to the gas liquor direct. The method about to be described is now in practical use at the Phœnix Gas-Works, and was contrived by Mr. Thomas Wills, the chemist to the company.



The arrangement of apparatus employed is represented in the diagram, where A is a glass flask of about 16-ounce capacity, provided with a closely fitting india-rubber stopper. Through this stopper passes the tube of the long funnel, B, which is provided with a glass stopcock, and likewise the tube, C, which is bent twice at right angles. The extreme end of the tube is slightly tapered, and dips into a 4-ounce flask, D. The body of the funnel, B, is graduated to deliver two ounces. The other apparatus required is a burette, with glass stopcock holding two ounces, and being divided into 32 equal parts, the graduations commencing from the lower part of the instrument; and two pipettes, one of 1-ounce capacity, and one graduated to deliver 2 ounces.

The test solutions used are three in number—viz., the ordinary 10 per cent. sulphuric acid, such as has been always in use for the valuation of liquor; a solution of ammonia of such strength as to neutralize an equal bulk of the test acid; and, finally a solution of caustic potash or soda, which may conveniently contain about 10 per cent. of either alkali. The two first-named test solutions should be made to correspond accurately with each other, but the potash or soda solution needs no precision in preparation.

The method of procedure is as follows:—One ounce of the liquor to be examined is introduced into the flask, A, being either measured by the graduated funnel, B, or, in cases where greater accuracy is required, the measurement should be made by means of the ounce pipette. The liquor is washed down with a little distilled water, and one ounce of the caustic potash or soda solution is then added, followed by about four ounces of water. The flask, D, is then charged with two ounces of test acid (measured by the pipette), and the apparatus is ready for use. Heat being applied to the flask, A, until the contents have reached the boiling point, brisk ebullition should be maintained for about fifteen minutes, at the end of which period the whole of the ammonia in the liquor will have distilled over into the flask, D, and have been there absorbed by the standard acid. The distillation being complete, the flask, D, is removed, a small quantity of tincture of hematine added to its contents, and the standard ammonia run in from the graduated burette until the change of the colour of the hematine from yellow to crimson indicates that all the excess of acid present has been neutralized. *The number of divisions remaining in the burette then indicates the "total ounce strength" of the liquor under examination.*

The main feature of novelty in the process above described consists in entirely dispensing with the use of a condenser, by which not only is the apparatus much simplified, but made more generally convenient. It might be thought that without proper means for condensing the ammoniacal vapours evolved during the distillation, a loss of ammonia would have taken place which would naturally have vitiated the result, and rendered the experiment valueless. Such a loss is, however, found in practice not to occur, and repeated experiments have proved that no loss of ammonia whatever takes place during the distillation, the absorption of the ammoniacal vapours by the test acid being complete even to the extent of being theoretically accurate.

The adjustment of the standard solutions used is also of great advantage in simplifying the test, more especially as the 10 per cent. acid now in use is made available for the purpose. A little thought will enable the reader to perceive the reason why the strength of the liquor under examination should be at once indicated by the number of divisions of test ammonia left in the burette at the conclusion of the experiment. As the test alkali is of equivalent strength to the test acid—that is to say, that equal bulks are required for neutralization—it follows that the bulk of test alkali left in the burette is really a direct indication of the measure of acid neutralized by the ammonia in the liquor, and thus of the strength of the liquor.

In the ordinary process of valuing gas liquor, equal bulks of the liquor under examination and of test acid are taken, and the latter gradually added to the former until neutralization occurs. If the whole of the test acid is required, the liquor is of 16-ounce strength, and consequently, if one ounce of liquor be taken, each 1-16th of an ounce measure of acid equals one ounce strength of liquor. It is obvious, therefore, that when one ounce of liquor is subjected to distillation, and the ammonia evolved conducted into two ounces measure of the test acid, if the whole of the latter had become neutralized, the first drop of test alkali added would change the colour of the hematine, and the liquor (reading from the burette divisions) would be of 32-ounce strength. If, on the other hand, it is assumed, for the sake of argument, that the liquor placed in the distillation flask contained absolutely no ammonia, it would be found, on the completion of the experiment, that the full measure of test alkali would be required to neutralize the contents of the small flask, and the liquid in the burette would stand at 0. The process will, therefore, indicate the strength of any sample of gas liquor up to 32-ounce, which is sufficient margin for all ordinary purposes. It is found to work well in practice, and the results are accurate.

Finally, taking into consideration the great value of gas liquor as a residual product, it needs but little to be said by us to urge upon gas companies the importance of basing all future liquor contracts on the *total* ammonia present, which can only be properly ascertained by the rejection of the old system of testing, and the adoption in its place of some such method as that which we have just described.

Glasgow Water Supply.—Dr. Mills, of the Andersonian University, Glasgow, reports that the water supplied to that city from Loch Katrine during May was of a pale brown colour, and contained a number of muddy and hairy particles. Iron traceable.

Blackpool Corporation Gas Supply.—At the meeting of the Town Council on the 5th inst., a proposal was made that the price of gas should be reduced from 4s. 2d. to 3s. 9d. per 1000 feet. The mayor, however, moved an amendment, that no alteration should be made. The reason given was that there was a heavy debt on the gas premises which should be first reduced, and that what money they could spare should go towards forming a reserve-fund to cover the damage caused by any future storm. This was generally agreed to be the wisest course, and it was adopted by fourteen votes to five.

THE BORING AT MESSRS. MEUX'S BREWERY.

Although somewhat late in the order of time, we believe that the following account of the bore-hole, recently sunk through the chalk and the gault strata into the lower greensand, at Messrs. Meux's Brewery, Tottenham Court Road, London, will be of interest to our readers:—

On Dec. 4, 1875, the Diamond Rock-Boring Company's machinery commenced sinking a bore-hole at the above brewery. Many years before, a well had been sunk through the tertiaries and the chalk to a depth of 265 feet below the Ordnance Bench mark in Oxford Street, which mark is 85 feet 7 inches above the mean level of the sea. In 1872–73 a bore-hole, 13 inches in diameter, had been taken down from the bottom of this well, by a rope boring-machine, to a depth of 803 feet below the same datum. The lower portion of this bore was out of the perpendicular and crooked, and at the above depth a heavy boring-head, weighing about 10 hundredweight, became detached from the rope, and got fast in the bottom of the bore. It was this bore that the company commenced to enlarge to 13½ inches in diameter, with a view of carrying down the hole to a greater depth, by means of a line of tubes having a diamond crown on the lower end.

The old bore-hole was successfully enlarged down to a distance of 490 feet from Oxford Street, or 225 feet below the bottom of the well, this portion of the old bore being pretty straight; and after reaching this depth the crown and line of tubes left the old bore, and cut a new bore-hole out of the solid chalk, and continued to do so till the depth of 547 feet was reached, when the old bore was again encountered, and was followed for a further depth of 13 feet. At a depth of 560 feet the new bore again reached solid chalk, and continued to be sunk in the solid until it was carried past the bottom of the old bore-hole. Fortunately the new bore-hole missed the boring-head in the old bore, and on the 21st of April last had been carried down to a total depth of 1024 feet.

Between a depth of 811 feet and 839 feet, the upper greensand was passed through; from 839 feet to 999 feet the gault was encountered; then came a layer of coprolite, 6 inches thick, succeeded by 4 feet 6 inches of limestone; and below the limestone the lower greensand was found—not in a loose condition, as is usually the case in a sand-pit, but in an indurated and solid state.

The bore-hole continued to be carried deeper, the sand being sufficiently indurated and hard to stand without being lined.

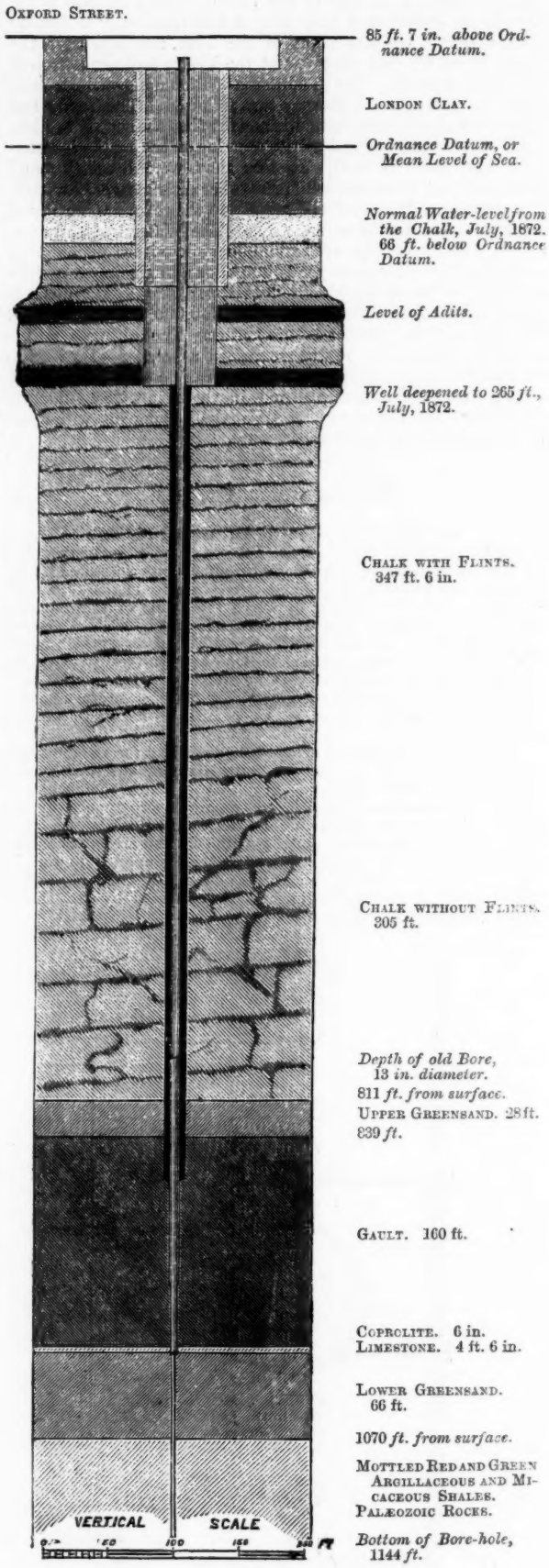
The bore-hole in the chalk, both with flints and without flints, is 13½ inches in diameter, and only 58 feet at the bottom is lined. The hole in the upper greensand is 13½ inches in diameter, and is lined throughout with a tube, having a minimum internal diameter of 11½ inches. The lower portion of this tube descends 30 feet into the upper stratum of the gault, and the upper portion ascends through the upper greensand and 58 feet into the lowest stratum of the chalk. The total length of the tube is 116 feet, the lower end resting in the gault at a depth of 870 feet from the Ordnance Bench mark in Oxford Street, to which depth the bore-hole is 13½ inches in diameter. A bore-hole 9¼ inches in diameter was afterwards sunk into the gault to a depth of 952 feet below the Ordnance Bench mark, and a water-tight tube, having a minimum internal diameter of 8¼ inches, was taken up from this depth to the top of the well. The remaining thickness of the gault and the stratum of limestone below is lined with a tube, having a minimum internal diameter of 7¼ inches. This tube is 225 feet long, the bottom reaching to a depth of 1005 feet.

The section appended shows the well, the lining tubes, and the thickness of the different strata passed through.

At 10 feet above the bottom of the well, or at a depth of about 199 feet 6 inches below Ordnance datum, the yield of water from the bore-hole, when it had reached the depth of 1022 feet, or had pierced the crust of the lower greensand 21 feet, was at the rate of about 1500 gallons per hour; and arrangements are now being made for placing a pump in the bore-hole at a depth of 200 feet from the bottom of the well, by which the delivery of water will be greatly increased. The temperature of the water is 57° Fahr.

The bore-hole was ultimately carried to a total depth of 1144 feet, the lower greensand proving only 66 feet thick, at a depth of 1070 feet, when the Palæozoic rocks were struck. These rocks were bored into a distance of 74 feet, the total depth of the bore-hole being 1144 feet.

The whole of this work has been carried on by the manager and engineer at Messrs. Meux's, under the superintendence of Mr. J. K. Gulland, who, until the end of March last, was chief engineer to the Diamond Rock-Boring Company. Mr. Gulland also superintended and carried out for that company the deep Sub-Wealden boring at Battle, in Sussex. Since resigning his connexion with the above-named company, Mr. Gulland has taken out a patent for an improved boring-machine, and has commenced to execute contracts for borings in connexion with the Diamond Drill Company, 6A, Victoria Street, Westminster.


OXFORD STREET.
85 ft. 7 in. above Ordnance Datum.
LONDON CLAY.
Ordnance Datum, or Mean Level of Sea.
Normal Water-level from the Chalk, July, 1872. 66 ft. below Ordnance Datum.
Level of Adits.
Well deepened to 265 ft., July, 1872.
CHALK WITH FLINTS. 347 ft. 6 in.
CHALK WITHOUT FLINTS. 305 ft.
Depth of old Bore, 13 in. diameter.
811 ft. from surface.
UPPER GREENSAND. 28 ft.
839 ft.
GAULT. 160 ft.
COPROLITE. 6 in.
LIMESTONE. 4 ft. 6 in.
LOWER GREENSAND. 66 ft.
1070 ft. from surface.
MOTTLED RED AND GREEN ARGILLACEOUS AND MICACEOUS SHALES. PALÆOZOIC ROCKS.
Bottom of Bore-hole, 1144 ft.
VERTICAL SCALE
0 50 100 150 200 FT

Horizontal Scale, ¼ in. = 1 foot.

WESTON-SUPER-MARE PUBLIC LIGHTING.—At the meeting of the Town Commissioners on the 13th inst., the question of the offer of the gas company, in reference to the public lighting, was further considered, and, after some discussion, it was resolved—"That the proposed terms of the Weston-super-Mare Gas Lighting Company for lighting, extinguishing, cleaning, and repairing the public lamps, at a reduction of 5s. per lamp per annum, and a reduction of £2 10s. on the lamps on the Esplanade, be accepted by this board for a term of five years."

Correspondence.

[We do not hold ourselves responsible for the opinions expressed by Correspondents.]

MR. GLADSTONE ON THE TRANSFER OF GAS AND WATER WORKS TO CORPORATIONS.

Sir,—I think the enclosed correspondence would interest the opponents, as well as the advocates, of transfers, and, as it originates out of your own "Circular," of the 5th of June, it has occurred to me that it would only be fitting that you should publish it *exclusively*. I should, however, like my own letter to appear in connexion with Mr. Gladstone's reply, without which it is not intelligible, and I should really be pleased to find his reply set forth prominently. The admirable impartiality with which your estimable Journal is always conducted, permits of my making the request, feeling beforehand it will be received in a cordial spirit. Arthur Silverthorne.

1, *Westminster Chambers, Victoria Street, S.W.,*
London, June 14, 1877.

[Enclosures.]

The Right Hon. W. E. Gladstone, M.P.

Sir,—Will you permit me to respectfully call your attention to the enclosed cutting out of a newspaper, which, though circulating necessarily amongst the restricted circle associated with an honourable branch of British manufacture—the supply of gas—is acknowledged to have considerable influence on the intereats of gas companies.

The views which the writer in the Journal of Gas Lighting, on behalf of the companies, builds on your presumed reticence may be perfectly groundless, and, on this account, some refutation may be necessary. I cannot say that I am acquainted with any public expression of yours on the subject, but I have no doubt that the transfer of gas-works to local authorities, whether "compulsory" or "by agreement," is a subject which has, at some time or other, occupied your attention, and that you are prepared to express your approval of that course, or to condemn it. I have myself attempted for some years to promote this course, and, under my advice, corporations have taken measures for compulsory purchase, notably Hanley, this session.

Although most of the large gas undertakings are rapidly passing into the hands of the corporations, it is chiefly by agreement, and unduly large amounts are paid, in consequence, for these undertakings, but the test of *compulsory purchase* presented to the private committees of either House is not frequent, and has only been successful in the cases of Glasgow, Aberdeen, Rotherham, Maryport, Stockton and Middlesbrough (Water), and Birmingham (Water)..

To Mr. Chamberlain, M.P., and his committee is entirely due the spirited policy promoted at Birmingham by the "compulsory purchase" of the water-works in 1875, and of the two gas undertakings "by agreement," some account of which is furnished in a pamphlet of mine on the subject published last year, now out of print (copy enclosed). The result of the first year's working at Birmingham has been a net profit of £34,122—that is, after all payments of annuities to companies, and all interest on mortgages and debenture stock; so that, in consequence, an amount of £25,000 has been paid to the borough treasurer on account of the borough improvement fund.

This is one of the phases of local government which is beginning to attract considerable attention, and I hope that, in presuming to call your attention to the remarks in the Journal of Gas Lighting, I may be so fortunate as to elicit an expression of opinion which, whatever way it inclines, is certain to be accepted with that amount of consideration and respect with which your opinions are invariably received in this country.

I am, Sir, your very obedient servant,
June 12, 1877. Arthur Silverthorne.

Arthur Silverthorne, Esq.

Sir,—Though viewing with some jealousy the conduct of commercial undertakings by public authorities and representative bodies, I think there are cases in which it becomes advisable and gainful. One of these I take to arise where a business, which ought to be economically concentrated, is distributed into the hands of many bodies, with great waste and public charge, as well as with much inconvenience to those who use the streets. Without, therefore, pronouncing any judgment, in the absence of full knowledge of detail, I am prepossessed in favour of the proceedings at Birmingham, and of any endeavour to apply similar principles to London.

Your faithful servant,
June 13, 1877. W. E. Gladstone.

CARBONATING FOUL LIME.

Sir,—In the evidence respecting the Crystal Palace District Company's Bill, Mr. Keates is reported to have said that I patented a process for deodorizing foul lime, by "passing the heated gases from a burning furnace through the purifiers, so as to use the carbonic acid, which was produced by the combustion, for decomposing the sulphide of calcium and producing carbonate of lime." There was such a patent taken out in 1853, but gaseous products of combustion from coke were taken from chimneys, and not passed through the lime *hot*. Again, he is reported to say: "He never carried it into execution himself, and nobody else has adopted it." Now, if any one will take the trouble to turn to vol. xxii., p. 1006, of the Journal of Gas Lighting, he will see what was done. The pipe for getting the products of combustion from the high chimney might have been seen reaching 100 feet up its side until a short time before the chimney was taken down, and the "ventilating" pipes remained connected to the purifiers from 1854 to the time that they were removed. I name this to show that the process was once in use, and refer to reasons why it was discontinued. W. Mann.

June, 1877.

MEETING OF THE BRITISH ASSOCIATION OF GAS MANAGERS.

Sir,—Since the meeting at Bristol, I have been informed that the death of the late Mr. Wood, of Bury, occurred at the commencement of the past year.

The omission to refer to it in my Inaugural Address was purely accidental.

Mr. Wood was one of the earliest members of the Association, and for several years one of its vice-presidents; he enjoyed the high esteem of all who had the pleasure of knowing him, and occupied an important position, which he adorned alike by his talents and virtues.

21, *Parliament Street, Westminster, S.W.,*
June 18, 1877. R. P. Spice.

Parliamentary Intelligence.

HOUSE OF LORDS.

Monday, June 11, 1877.

The following Bills received the Royal Assent by Commission:—Alliance and Dublin Consumers Gas (Bray Supply); Edinburgh and District Water; Longton Corporation; Maryport District and Harbour Gas; Middlesbrough Corporation; Sittingbourne Gas; Stamford Water; Warrington Corporation Gas.

The Examiners reported that the further Standing Orders applicable to the Bishop Auckland District Gas, Burslem Local Board, Carshalton Gas, and Christchurch Gas Bills have been complied with; that no further Standing Orders are applicable to the Newcastle-under-Lyme Borough Extension and Improvement, and Bridgwater Corporation Water Bills; and that the Standing Order applicable to the Local Government (Gas) Provisional Orders (Penrith, &c.) Bill has been complied with.

The following reports from the Standing Orders Committee were agreed to:—"That the Standing Orders not complied with in respect of the Newcastle and Gateshead Water and Colne Gas Bills ought to be dispensed with, and the Bills allowed to proceed." "That the Standing Orders not complied with in respect of the Wakefield Improvement Bill ought to be dispensed with, and the Bill allowed to proceed, provided that Part II. and the Schedule be struck out, unless proof be given before the Examiners that the Bill has been approved of by the proprietors of the Wakefield Water-Works, as required by Standing Order 64."

The United General Gas Company (Limerick) and the Woolwich, Plumstead, and Charlton Consumers Gas Bills, brought from the Commons, were read the first time, and referred to the Examiners.

The following Bills were read a second time and committed:—Ashton-under-Lyne Improvement; Bolton Improvement; Croydon Commercial Gas; Dukinfield and Denton Local Boards of Health; Epsom and Ewell Gas; Leicester Gas; Ramsgate Local Board; Wakefield Gas.

Petitions were presented against the Bishop Auckland District Gas Bill from (1) Witton Park Gaslight and Coke Company, Limited, (2) Churchwardens, overseers, and inhabitants of Shilden and East Thickley; and in favour of it from Owners of property, &c., in West Auckland and St. Helen Auckland.

Tuesday, June 12.

The Examiners reported that no further Standing Orders are applicable to the Thanet Gas Bill.

The following Bills were read a second time and committed:—Glasgow Corporation Water; Heywood Water; Sunningdale District Water; Tudhoe and Sunderland Bridge Gas.

The Newport (Monmouthshire) Gas Bill was read the third time and passed.

The Waterford Gas Bill, brought from the Commons, was read the first time, and referred to the Examiners.

The Local Government (Gas) Provisional Orders (Penrith, &c.) Bill was read a second time, and committed to a Committee of the whole House

Petitions against the Newcastle-unde-Lyme Borough Extensions and Improvement Bill were presented, from (1) Trustees of the Newcastle-under-Lyme Marsh Lands, (2) Ratepayers and inhabitants of Trentham, (3) W. H. Dutton, (4) Rev. W. Sneyd and others.

Thursday, June 14.

The Chairman of Committees informed the House that the opposition to the Dukinfield and Denton Local Boards of Health Bill was withdrawn.

The Examiners reported that the further Standing Orders applicable to the United General Gas Company (Limerick) Bill have been complied with; that no further Standing Orders are applicable to the Woolwich, Plumstead, and Charlton Consumers Gas and the Waterford Gas Bills; and that the Standing Order applicable to the Local Government Board's Provisional Orders Confirmation (Bishop Auckland, &c.) Bill has been complied with.

The following Bills were read a second time and committed:—Bridgwater Corporation Water; Burslem Local Board; Carshalton Gas; Christchurch Gas; Colne Gas; Newcastle and Gateshead Water; Newcastle-under-Lyme Borough Extension and Improvement; Stretford Gas; Wakefield Improvement.

The Local Government (Gas) Provisional Orders (Penrith, &c.) Bill was considered in committee of the whole House, and reported without amendment.

A petition in favour of the Kent Water Bill was presented from the Board of Guardians of Bromley Union.

Friday, June 15.

The Bristol United Gas and Thanet Gas Bills were read a second time and committed.

The Examiners reported that the further Standing Orders applicable to the Southend Gas Bill have been complied with.

The Local Government (Gas) Provisional Orders (Penrith, &c.) Bill was read the third time and passed.

HOUSE OF COMMONS.

Monday, June 11, 1877.

The Lords amendments to the Dundee Gas Bill were agreed to.

The United General Gas Company (Limerick), and the Woolwich, Plumstead, and Charlton Consumers Gas Bills were read the third time and passed.

The East Worcestershire Water Bill (Lords) was read a second time and committed.

The Examiners reported that the Standing Orders not previously inquired into have been complied with in the case of the Londonderry Gas Bill (Lords).

WATERFORD GAS BILL.

Sir Charles Forster moved—"That in the case of the Waterford Gas Bill, Standing Orders 84, 214, 215, and 239 be suspended, and that the Bill, as amended in committee, be now taken into consideration, provided amended prints shall have been previously deposited."

Mr. Butt said there was a very serious question whether the Select Committee had not exceeded their powers. Under their previous Act the company were required to give a discount of 20 per cent. on the price of gas. This Bill reduced it to 15 per cent., but no notice was inserted in the notices for the Bill that this reduction would be proposed. The Corporation of Waterford opposed the Bill, and this reduction was made in the absence of the opponents. The representatives of the corporation thought that was beyond the powers of the committee, and he moved, therefore, that the Standing Orders be not suspended.

Mr. R. Bright (chairman of the Select Committee) said that the committee had passed the preamble of the Bill, with condition that the sliding scale and the standard price clauses should be inserted. The opponents of the Bill exercised their discretion, and withdrew their opposition. The committee were not altogether satisfied with the standard price proposed, but did not feel justified in altering it. After hearing the evidence of Mr. Spice, an eminent gas engineer, they thought the price was fair both to

the consumers and to the company, and that the discount of 15 per cent. was a reasonable amount. The committee thought themselves justified in taking the course they did, because this was not a final stage at which any grievance could be heard. There was another place at which any objection to the principles might be raised. He hoped the House would not accede to the amendment that had been proposed.

After some remarks from a member of the committee, who stated that an increase of illuminating power was given in the Bill from 8 to 14 candles,

The amendment was withdrawn, and the original motion for suspending the Standing Orders having been passed, the Bill, as amended, was considered.

PUBLIC HEALTH (METROPOLIS) BILL.—This Bill was read a second time and committed.

TUESDAY, JUNE 12.

The Waterford Gas Bill was read the third time, and passed.

The Examiners reported that the Standing Order applicable thereto had been complied with in the case of the Gas and Water Orders Confirmation (Brotton, &c.) Bill (Lords).

WEDNESDAY, JUNE 13.

The Gas and Water Orders Confirmation (Brotton, &c.) Bill (Lords) was read a second time and committed.

A petition against the Waterford Gas Bill was presented from Inhabitants of Waterford.

Legal Intelligence.

SUPREME COURT OF JUDICATURE—COURT OF APPEAL.

MONDAY, TUESDAY, AND WEDNESDAY, JUNE 11, 12, AND 13.

(*Before the* LORD CHANCELLOR, *the* LORD CHIEF JUSTICE, *and Lord Justice* BRETT.)

ATKINSON *v.* THE NEWCASTLE AND GATESHEAD WATER COMPANY.

This case came on by way of appeal from the decision of the Exchequer Division refusing a new trial, and also as an appeal from a judgment of the same Court on demurrer.

The plaintiff is the owner of the Elswick Saw Mills, Newcastle, within the limits of the defendants district; and the defendants are a company regulated by a private Act, with which the Water-Works Clauses Act, 1847, is incorporated. By these Acts they are obliged to fix fire-plugs in the streets, and supply them with water at a certain pressure, and to supply the Town Commissioners with water for certain purposes, and to supply all the houses in Newcastle and Gateshead with water at the same pressure, under a penalty of £10, and (in the case of the Town Commissioners and the domestic supply to the inhabitants) an additional forfeiture to the party aggrieved of 40s. for each day's failure to perform their duty in that respect, unless prevented by frost, unusual drought, or unavoidable cause or accident, or during necessary repairs. They are also empowered to supply water by special contract for trade purposes, or purposes other than domestic. Under this power they had contracted to supply water to two hydrants on the plaintiff's premises, for the purposes of his business, but no express terms had been made as to pressure. The contract rate for all the water used by the plaintiff, including the supply to the hydrants, was £30 per annum. A fire broke out on the plaintiff's premises on Feb. 20, 1870. It was discovered at eight in the morning, but on the hydrants being put in requisition, it was found that for some reason the pressure, which was usually sufficient to throw the water to the top storey of the premises, was insufficient to throw it upon the fire at all, so that the hydrants were absolutely useless. The fire-plugs near the premises were found to be in the same state as the hydrants. In the afternoon the pressure improved, but not before the premises had been almost destroyed. At three o'clock the hydrants were at full pressure, and by them the fire was ultimately put out. At the trial, two causes of action were alleged—first, the breach of statutory duty of which the defendants were guilty, in not keeping the fire-plugs supplied; and, secondly, a breach of contract, in not keeping the plaintiff's hydrants supplied with water at the statutory pressure. The defendants demurred to the part of the declaration which claimed damages for the breach of their statutory duty, on the ground that their liability was limited to 40s. penalty. This demurrer was overruled by the Court of Exchequer, on May 25, 1871. At the trial, before Baron Martin, evidence was given showing that the water supply in Newcastle and Gateshead was effected by gravitation from the High Benwell and Whitwell reservoirs, and that if the communications and valves had been in order there must have been sufficient pressure; but no suggestion was made as to what was the cause of the absence of pressure. The jury, in answer to questions by the learned judge, found that there had been a deficiency in the statutory pressure at all the plugs, and at the hydrants, on the occasion in question; and that the deficiency was caused by an unavoidable accident; and also that there was no contract between the parties for the supply of water at the hydrants at the statutory pressure. The verdict was, therefore, entered for the defendants; and the plaintiff having obtained a rule *nisi* for a new trial, on the grounds of misdirection, and that the verdict was against the weight of evidence, the rule was discharged by the Court of Exchequer. Cross appeals were thereupon brought—by the defendants against the judgment on the demurrer, and by the plaintiff against that on a rule for a new trial.

Mr. CHARLES RUSSELL, Q.C., Mr. GAINFORD BRUCE, and Mr. SHIELD appeared for the plaintiff; and the ATTORNEY-GENERAL, Mr. HERSCHELL, Q.C., and Mr. CROMPTON for the defendants.

The LORD CHANCELLOR, in delivering judgment, said the Court was called upon in this case, after a period of six years—a period which reminded him of the Statute of Limitations—to review the decision of the Court below upon demurrer, and to review also the proceedings upon the whole of the case upon the issues of fact. The questions which arose in the case were three. First, upon the occurrence, whether the first count of the declaration showed a sufficient cause of action. The second question arose on the second count of the declaration, and proceeded upon contract, whether the finding of the jury, that no such contract existed, was arrived at in a manner which ought to be satisfactory to the Court of Appeal. The third question was whether, supposing there was such a right of action as alleged in the first count of the declaration, or such a right of action under contract as alleged in the second, that which took place in this case, and which was complained of, was carried by the words, "unavoidable cause or accident," in the 42nd section of the Water-Works Clauses Act, 1847. With regard to the first question, he was of opinion that the construction of the Act was not to create any duty which would be the subject of action afterwards, at the suit of any individual who was in any way injured by its breach. It did not create a right to be enforced in the ordinary way by action, but the scheme of the Act was to lay down a series of duties to be performed by the company, and to provide, as a guarantee and security for the performance of those duties, certain specified penalties. It provided that, where it was convenient, the penalty should go into the pocket of the party aggrieved; but where that was not possible, the wrong being a public one, the penalty should be public also. It would be impossible to hold that where the penalty was given to the individual there was no right of action; but where it was not so, as in the case of the fire-plugs, an action would lie; for then the result would be that persons who had paid for the water would have no right of action if injured by the failure to supply it, while those who had paid nothing would have their action against the company. His lordship then reviewed the authorities distinguishing and throwing doubts on that of *Crouch v. Steel* (3 Ell. and Black, 402), and said he dissented from the principle there laid down by Lord Campbell, that when there was a statutory duty in a person, and another showed that he had sustained injury by the breach of it, he could bring his action under the statute. That must depend in a great measure upon the particular statute, and this case was distinguishable from the one referred to. But he could not look upon *Crouch v. Steel* as any authority to decide the present case, for some other following it had been cited. Under those circumstances he came to the conclusion that the first count of the declaration did not set forth any cause of action for the plaintiff under the statute, and, therefore, the demurrer of the defendants must be allowed. The second count of the declaration raised a question of contract between Mr. Atkinson and the defendants, for the latter to supply him with water at the statutory pressure for the extinguishment of fire. The case pressed by the plaintiff was that as the additional supply of water was furnished under contract, it must be implied that it was to be used for the purpose of the extinguishment of fire, and to be kept at the statutory pressure. His lordship had a strong impression that such a contract was not implied, and that all the company undertook in the second supply was what they were bound by in the original supply. There was, therefore, no substantial misdirection by the learned judge, the question had been properly left to the jury, and their verdict ought not to be disturbed. As the third question (as to the meaning of the term "unavoidable cause or accident"), in the view which had been taken of the first two, did not arise, the appeal must be dismissed with costs.

The LORD CHIEF JUSTICE and Lord Justice BRETT concurred; the former, however, expressing some doubts as to whether there was not an implied contract between the parties to supply water to the hydrants on the statutory terms.

The judgment on the whole case is, therefore, for the defendants.

HIGH COURT OF JUSTICE—EXCHEQUER DIVISION.

TUESDAY, JUNE 12.

(*Before the* LORD CHIEF BARON, *and Barons* CLEASBY *and* HUDDLESTON.)

IMPERIAL CONTINENTAL GAS ASSOCIATION, *Appellants*, *v.* NICHOLSON, SURVEYOR, ETC., *Respondent*.

This was a case stated for the opinion of the Court under Part III. of the Act 37 & 38 Vict., cap. 16, as to income-tax.

The SOLICITOR-GENERAL and Mr. DICEY appeared for the Crown; Mr. A. CHARLES, Q.C., and Mr. A. MORTIMER were counsel for the appellants.

It appeared from the case that the offices of the association are at 30, Clement's Lane, Lombard Street, where the meetings of the directors of the association are held. The association possess interests of various natures and tenures in gas-works in France, Germany, Austria, Holland, and Belgium, the profits of which arise wholly in those foreign countries, and in such of them as have a tax equivalent to the income-tax, those profits are assessed to such tax. The appellants claim to be assessed on a sum of £210,665, while the Crown claims to tax in round numbers £50,000 more. For the appellants there was cited the 16 & 17 Vict., cap. 34, which directs that the rule of the former Act, 5 & 6 Vict., cap. 35, shall be followed. By this Act gas-works are expressly classed with lands, tenements, and hereditaments, and the learned counsel submitted that the present works should be assessed in this way, as being foreign possessions, though held by an English corporation, the profits of which were analogous to those accruing from land. This property should be assessed under Part V., as it was clearly foreign property. The whole policy of the taxes on property was to tax profits received in this country, and the case found that this money was also taxed abroad. The argument for the Crown was that the words of the Act must be strictly adhered to. These ran (16 & 17 Vict., cap. 34, sec. 2, Schedule D): "Any profits or gains arising or accruing to any person residing in the United Kingdom from any profession, trade, employment, or vocation, or from any property whatever, either in the United Kingdom or elsewhere." The Act was not to be frittered away by the rules, which were merely for the purpose of carrying out the Act. It had been already decided, in the case of *The Cesena Sulphur Company v. Nicholson*, that these companies were resident in England, and that case governed the present. This money was clearly within the words of the schedule as profits arising from a trade or employment.

The LORD CHIEF BARON, in delivering judgment, said that Mr. Charles's able argument for the appellants had raised doubts in the mind of the Court as to whether the Cesena case had been properly decided. After careful consideration, however, he was of opinion that the Crown was entitled to judgment, as there was no substantial distinction between that case and the present. The two companies were joint-stock, formed, registered, established, and, by the decision of the former case, resident in England. If Mr. Charles's contention was right, the Cesena case was wrongly decided, and this Court would have to overrule its deliberate decision, as mines were in the same category as gas-works. He (the Lord Chief Baron) would not, perhaps, shrink from taking such a course, if he thought justice required it, as there was no appeal in these cases. But that objection, which was not taken in the Cesena case, would not have prevailed then, and ought not to do so now. When gas-works were mentioned in the Act, it was plain those in the United Kingdom or Colonies were meant. The rules, therefore, applicable to such property in England could not be extended to those on the Continent. In his opinion, the whole profits of the undertaking were assessable. In conclusion, his lordship remarked: I am desired by my brother Cleasby to say, as he is a shareholder in the appellant company, he thought he ought not to be a party to this judgment.

Baron HUDDLESTON concurred, and said the question was whether income-tax should be paid by the appellants on £210,665, or on £48,005 more, on which exemption was claimed, on the ground that the profits were never transmitted to this country at all, but were retained abroad in liquidation of charges consequent on the exigencies of foreign lighting. This money was clearly the profits of a trade in ordinary parlance, as the making of gas was not distinguished from any other trade. If Mr. Charles's contention was right, the Cesena case was wrongly decided. Judgment must be for the Crown.

Mr. DICEY applied for costs; and

The LORD CHIEF BARON said he was afraid he must give them.

Mr. CHARLES hoped the example in the Cesena case would be followed, where each party was ordered to pay his own costs. His contention had never been put forward before.

The LORD CHIEF BARON said in that case the point had arisen for the first time, but this was in reality in the nature of an appeal from that decision. Judgment must go for the Crown, with costs.

CHESTERFIELD POLICE COURT.—SATURDAY, JUNE 2.

(*Before Mr.* BARNES *and Mr.* MARKHAM.)

CONVICTION OF A WATER COMPANY FOR ILLEGALLY CUTTING OFF SUPPLY.

The Chesterfield Water-Works Company appeared to a summons, taken out against them by Mr. William Bland, one of the masters at the New Whittington Endowed School, for neglecting and refusing to furnish him with a proper or any supply of water, he being entitled to the same, on the 25th of May.

Mr. BUSBY, who appeared on behalf of the complainant, stated that by the Act under which the information was laid, a person who had paid or tendered his water-rate was entitled to a supply of water, and if the company refused or neglected to supply the water they were liable to a penalty of £10, half of which went to the informer, and half to the overseers. In this case it appeared that there were three different schools and school-houses at Whittington. The company for some time supplied water to these schools for 12s. per year, but a short time ago increased the amount to £4 per school, or nearly seven times the amount agreed upon. The governors demurred, and, pending the settlement of the dispute, the company thought proper to cut off the supply of water. But they proceeded further, and cut off the supply from the masters houses, which were provided for separately, and for which the rate had been paid.

The receipt for water from Lady-day to Midsummer was handed in.

Mr. *William Bland*, the complainant, was called, and stated that on Friday, the 25th of May, the water supply for his house was cut off, and was not restored until the following Wednesday. The rate was paid in advance. It was possible to cut off the supply to the school without interfering with his house at all. He sent a notice to the water company on Wednesday, the 30th ult., and the supply was soon after restored.

Mr. *Jones*, the manager of the water company, submitted that they were not bound to furnish a supply unless a person provided "his own connexion-pipe," which had not been done in this case. They had not received notice in writing according to section 53 of the Act. The company were not bound to supply the house on account of the water having to pass through the same pipe as that supplied to the schools, and the complainant not having laid down separate pipes, they treated him as having water on sufferance. He also urged that by special powers obtained by the company they were not bound to give a full supply above the Club Mill reservoir, on account of its high elevation. Whittington was above the Club Mill reservoir, therefore the company were only bound to give an intermittent supply.

Mr. BARNES said no doubt the company had very peremptory powers, but they should be exercised with great circumspection. It was clear that in stopping Mr. Bland's supply they had acted beyond their powers, and for so doing they must submit to the usual penalty of £10 provided by the Act.

BIRMINGHAM WATER SUPPLY.—Dr. Hill, the Medical Officer of Health for Birmingham, reports that the water supplied last month to that town was clear, and that the organic matter continued to decrease.

PRESENTATION TO MR. W. H. HOLLINGSHEAD.—An extremely interesting meeting, arising out of the recent amalgamation of the gas companies north of the Thames, has just taken place at the offices of the late Imperial Gas Company, High Street, Camden Town, the occasion being the presentation of a testimonial to their oldest officer, Mr. William Hardy Hollingshead, upon his retirement on superannuation. There was a large attendance of his former colleagues. The testimonial, exhibited in the room, consisted of a splendid drum-head marble and malachite timepiece, with vases to match, the clock bearing the following inscription:—"Presented, with the accompanying pair of vases, to Mr. William Hardy Hollingshead, on his retirement, after 38 years honourable service with the Imperial Gaslight and Coke Company. Presented by his late colleagues, with their best wishes for his welfare. May, 1877." The testimonial was accompanied by a document bearing the names of the 50 gentlemen who subscribed towards the object, and an address, as follows:—"22, High Street, Camden Town, May, 1877.—Dear Mr. Hollingshead,—With feelings of great pleasure we unite together to express to you, our old and much-respected colleague, our good-will and good wishes on your retirement from active service, as the oldest officer of the late Imperial Gaslight and Coke Company. We beg your acceptance of the timepiece and vases, which we offer with our sincere regards for your welfare, and earnestly wish you a long and happy retirement. —Signed, &c." Mr. Randal occupied the chair, and opened the proceedings by explaining the object of the gathering. As chairman, the pleasing duty was imposed upon him to offer Mr. Hollingshead, for his acceptance, the testimonial now before them, which had been most cheerfully subscribed for by his late colleagues, as a token of their great regard and respect. He was pleased to have an opportunity of saying a few words in reference to Mr. Hollingshead, who had proved his excellent friend for 34 years. Mr. Hollingshead's good qualities were thoroughly appreciated by all who knew him. He might say now, what he never said before, that when he was appointed to do outdoor work Mr. Hollingshead gave him the benefit of his advice in regard to his duties, which was very valuable, and was an abiding influence. He was a young man then, and advice from a man like Mr. Hollingshead was very valuable at that time, when the Imperial were in active competition with the London, Equitable, and Western Gas Companies, and when great care was required to keep the company's connexion together, and secure fresh customers. He need not say that the personal qualifications of Mr. Hollingshead eminently fitted him to bring many customers to the Imperial Gas Company at the time to which he referred. They all knew how hard their friend must have laboured to be so successful at that juncture, when opposition was so powerful; but he might safely say that was the time when Mr. Hollingshead's services shone the brightest. He was certainly a man who had nobly done his duty, and was deserving of their admiration and respect. They all wished to give Mr. Hollingshead proof of their regard for him, and the clock before them was a practical illustration of it. Personally, he was sorry that so many old friends were leaving them one by one, because, with the exception of Mr. F. Dale, there were hardly any old faces left. They were all very glad to see their friend looking so well, and hoped he might have long life and happiness. The chairman then presented the testimonial and address amid much applause. Mr. Hollingshead, who on rising was loudly cheered, said this came upon him quite unexpectedly, but he must say that he felt very proud of the most handsome testimonial just presented to him, and of the friends who had subscribed to it. They might all rest assured that he would take care that the gift was never abused so long as he or his dear wife lived, and afterwards it would be handed down to his family as an heirloom. He really could not find words to express his thanks adequately. He quite agreed with Mr. Randal that there were great difficulties at the time referred to, and there was far more work then than there was now, because the duties were now more mechanical. The strife of former days was no good either to the company or the consumers. He had to thank them once more for the testimonial. Mr. F. Dale, of the chief office, Bedford Row, Mr. J. J. Bird, Mr. J. Holder, Mr. F. Purry, and Mr. Wills, spoke in eulogistic terms of Mr. Hollingshead, and a vote of thanks to the chairman brought the proceedings to a close.

Miscellaneous News.

METROPOLIS WATER SUPPLY.

The Registrar-General publishes the following return of the average daily quantity of water supplied by the London Water Companies during the month of May, 1877. According to this, 117,591,830 gallons, or 534,274 cubic mètres of water (equal to about as many *tuns* by measure, *tons* by weight), were supplied daily; or 220·8 gallons (100·3 decalitres) rather more than a *ton* by weight, to each house, and 31·1 gallons (14·1 decalitres) to each person, against 32·4 gallons in May, 1876. According to returns of the London Water Companies made to the Select Committee on East London Water Bills (Session 1867), it is estimated that, during the year 1866, about 82 per cent. of the total supply of water for all purposes was for domestic use. Applying this proportion to the total quantity supplied daily in the month of May, 1877, it may be estimated that about 96,425,301 gallons were used for domestic purposes, or about 25·5 gallons per day for each inhabitant, against 26·6 in the corresponding month of last year.

COMPANIES.	Number of Houses, &c., supplied in May, 1876.	Number of Houses, &c., supplied in May, 1877.	Aver. Daily Supply of Water in Gallons* during May, 1876.	Aver. Daily Supply of Water in Gallons* during May, 1877.
Total supply	525,878	532,613	121,146,288	117,591,830
From Thames	247,713	250,034	62,057,956	59,218,609
„ Lea and other Sources	278,165	282,579	59,088,332	58,373,221
THAMES.				
Chelsea	28,670	28,741	7,936,500	7,560,600
West Middlesex	47,920	49,162	10,237,235	10,334,504
Southwark and Vauxhall	80,456	78,000	19,470,500	17,750,000
Grand Junction	36,616	37,683	11,653,121	10,698,605
Lambeth	54,051	56,448	12,760,600	12,874,960
LEA AND OTHER SOURCES.				
New River	124,182	125,180	26,629,000	25,973,000
East London	109,375	111,967	25,086,700	23,403,400
Kent	44,608	45,432	7,372,632	6,996,821

* Including that for manufactures and for various purposes other than for domestic consumption.

Note.—The return for May, 1877, as compared with that for the corresponding month of 1876, shows an increase of 6735 houses, and a decrease of 3,554,458 gallons of water supplied daily.

Dr. Frankland reports as the result of his analysis of the waters supplied to the Metropolis and some of its suburbs during May, that taking, unity to represent the average amount of organic impurity in a given volume of the Kent Company's water during the last nine years, the proportional amount of such impurity in an equal volume of water supplied by each of the other companies, and by the Tottenham Local Board, was:—Tottenham 0·3, Kent 1·2, East London 1·8, New River 2·0, Colne Valley 2·2, Chelsea 2·2, Grand Junction 2·2, Lambeth 2·8, West Middlesex 2·9 and Southwark 3·1. The river waters delivered by the Chelsea, West Middlesex, Southwark, Grand Junction, Lambeth, New River, and East London Companies had greatly improved since last report, and had assumed their summer quality. They were all efficiently filtered before delivery. The water supplied, from artesian wells, to the inner circle by the Kent Company, and to the outer circle by the Colne Valley Company and the Tottenham Local Board of Health, was wholesome and palatable, and of most excellent quality for dietetic purposes. The Colne Valley water was also soft and suitable for washing, but it was slightly turbid from suspended particles of chalk. Seen through a stratum 2 feet deep, the Kent and Tottenham waters were clear and colourless; the Colne Valley turbid and colourless; the New River, West Middlesex, and Lambeth, clear and very nearly colourless; the East London, clear and very pale yellow; and the Southwark and Chelsea, clear and very pale brown.

Results of Analysis expressed in Parts per 100,000.

Companies or Local Authorities.	Total Solid Matters.	Organic Carbon.	Organic Nitrogen.	Ammonia.	Nitrogen, as Nitrates and Nitrites.	Total combined Nitrogen.	Chlorine.	Total Hardness.
Inner Circle.								
Thames—								
Chelsea	27·70	·121	·010	0	·288	·298	1·55	19·6
West Middlesex	27·54	·141	·031	0	·273	·304	1·55	19·6
Southwark and Vauxhall	27·28	·165	·016	·001	·252	·269	1·55	19·4
Grand Junction	28·10	·120	·012	0	·263	·275	1·50	19·4
Lambeth	29·50	·141	·025	0	·292	·317	1·55	20·1
Other Sources—								
New River	26·78	·110	·009	0	·276	·285	1·50	19·6
East London	28·74	·097	·012	0	·246	·258	1·70	19·7
Kent	44·80	·066	·004	0	·524	·528	2·50	28·7
Outer Circle.								
Colne Valley	16·20	·121	·009	0	·208	·217	1·20	3·0
Tottenham Board of Health	45·80	·016	·004	0	·420	·424	3·15	24·7
Corporation of Birmingham*	27·80	·120	·023	·001	·206	·230	1·55	16·1
Corporation of Glasgow+	2·64	·177	·000	·000	·003	·003	·75	·9

* Analyzed by Dr. Alfred Hill, Medical Officer of Health and Analyst to the Borough.
+ Analyzed by Dr. E. J. Mills, F.R.S., of the Andersonian University, Glasgow.

Note.—The numbers in the analytical table can be converted into grains per imperial gallon by multiplying them by seven, and then moving the decimal point one place to the left. The same operation transforms the hardness in the table into degrees of hardness on Clark's scale.

IRON AND COAL TRADES OF SHEFFIELD, SOUTH YORKSHIRE, AND NORTH DERBYSHIRE.

(FROM OUR OWN CORRESPONDENT.)

It is almost universally admitted that business in this district has hardly ever been slower or more unsatisfactory, both as to extent and profits, than at the present time. The most careful observations and the most diligent inquiries fail to discover that there is any prospect of a real improvement in the iron trade within at least twelve months, unless before the expiration of that period the Eastern Question shall have been disposed of, and the present war ended. These contingencies are so improbable, however, that some of the best commercial men we have are clearly of opinion that it may be eighteen months or more before there is any decided alteration for the better. This opinion has been publicly expressed by Mr. J. Stores Smith, of Sheepbridge Works, and other gentlemen of unquestioned ability and standing.

Hence at the present time there is considerable quietude in almost every branch of trade, with a current weakness of prices which is very materially in favour of buyers, particularly those who can throw large orders into the market. Pig iron here, in full sympathy with the Scotch and other

markets of the country, is weak, only a limited number of sales having been made this week on the bases of the following quotations:—Ordinary Derbyshire foundry brands, £2 5s. to £2 15s.; Lincolnshire No. 1 foundry, 59s.; No. 3, 53s.; No. 4, 50s.; No. 4 forge, 49s.; mottled and white, 47s. to 48s., f.o.b. at Frodingham; "Acklam" No. 1, 47s.; No. 2, 45s.; No. 3, 43s.; No. 4, 42s.; forge, 42s.; "Aireside Leeds" No. 1, 53s.; No. 2, 49s.; No. 3, 48s.; No. 4, 47s.; forge, 47s.; M., 46s.; W., 45s.; "Redcar," 42s. to 47s. 6d.; G.M.B. (Middlesbrough) No. 1 foundry 45s. 6d.; No. 2 foundry, 44s.; No. 3 foundry, 42s.; No. 4 foundry, 41s. 6d.; No. 4 forge, grey, 41s.; No. 5 forge, mottled, 40s. 6d.; No. 6 forge, white, 40s.; refined metal, 59s.; Kentledge, 46s.; and cinder, 40s.; f.o.b. for net cash.

There is a decidedly better demand for several kinds of fuel, house coal being, naturally, in least request at this season of the year. Somewhat singularly, however, statistics go to prove that more coal was conveyed to London by rail during May than any previous month this year. This may, perhaps, be repeated now, unless the settlement of the northern strikes should give seaborne fuel its proper status. Steam and gas coal are in fairly good request, the former for export, and the latter for long-dated contracts.

THE LANCASHIRE COAL AND IRON TRADES.

(FROM OUR OWN CORRESPONDENT.)

Contracts for the supply of gas coal for next season continue to be placed, and, in some recently given out, 9s. to 9s. 6d. per ton is being paid for mixed coal and cannel at the pit's mouth, but for ordinary screened gas coal not more than about 8s. per ton at the pit is, as a rule, being obtained. The stoppage of the pits in West Lancashire has not yet had any material effect upon the market, and for another week or so, should the strike continue, it is scarcely probable that it will be seriously felt, as the stocks on hand will carry colliery proprietors and consumers over the present month without much scarcity of supplies being experienced. In the meantime, prices continue firm, and in a few cases more money is being asked, chiefly from new customers, but the general pit prices are without any very material change, except that slack is a little dearer, an advance of 1s. per ton having been obtained in some quarters. House fire qualities of coal are in less demand; common coal also is not moving off quite so freely as a week or two back, and in the Manchester district coalowners have been taking less out of stock than they were at the end of last month. Good classes of burgy move off tolerably well. Pit prices may be given about as under:—Good Arley about 10s. per ton; best, 10s. 6d.; Pemberton four-feet, 8s. to 9s.; common coal, 6s. 6d. to 7s.; burgy, 5s. 6d. to 6s.; and slack, 4s. to 5s. per ton.

In the shipping trade prices are firm, but there is only a small amount of business passing.

The colliers in West Lancashire, who are out on strike against the reduction of 10 per cent., show no signs as yet of giving way, and, with the exception of the one or two districts which I referred to last week, there are very few of the colliery proprietors who show any signs of weakness.

The iron trade continues in a most depressed condition, and north country brands of pig iron are being pressed in this market at very low prices. The local makers are securing very little new business, but their quotations are without material change. In the finished iron trade also there are very few orders giving out, and local bars delivered into the Manchester district can be bought at prices ranging from £6 10s. to £6 15s. per ton.

Engineers are slack, and one large firm, I understand, will shortly discharge a considerable number of hands.

THE COAL AND GENERAL TRADE OF THE NORTH.

(FROM OUR OWN CORRESPONDENT.)

Since our last report the whole of the Northumberland collieries have resumed work. As a number of orders had stood over during the strike, the pits are likely to be very well employed for the next ten days at any rate. The principal demand for steam coals is from Cronstadt and the Baltic. In consequence of the resumption of work at the Northumberland pits, trade is not so pressing amongst the Durham collieries, though at the same time a considerable number of orders which were given during the strike have to be completed. Shipments have been active from the Durham pits. The demand being for a class of coals which could be used as steam or manufacturing coals, the latter for the local factories and shipbuilding yards. The inquiry has not been quite so good for gas coals. Fewer have been shipped, but the prices are about the same, ranging from 6s. 6d. up to 8s. 6d., and in some few instances 9s. 6d. per ton. There will be a pretty active business at most of the collieries in the neighbourhood of the Tyne this week, as next week is Newcastle races, when most of the pits are closed for two or three days.

The supply of small coasting vessels has been restricted, as the recent strike in the Northumberland district induced owners to send their ships to other parts of the country to load coals. Last week, therefore, when the Northumberland collieries began to resume work, handy little coasters were found to be rather scarce, and more money had to be paid to such as could be beached with cargoes. The demand has been from the east coast and the British Channel; the advance has not been great, however, probably from 3d. to 6d. per ton. There has been no absolute change in ports open to steamers, as there is an ample supply of coasting steamers at the command of the coal shippers. Outward freights to the Mediterranean and Baltic are lower than they were, and a very quiet business is doing thence.

The iron trade of the North of England is absolutely without change. The Birtley Iron Company have a considerable quantity of gas and water pipes ready for shipment, and a good deal of business is being transacted in iron shipbuilding, marine engine building, and the manufacture of large cables for mooring purposes for the Government.

The chemical trade has improved. The fire-clay goods trade and the cement trade are only quiet, with moderate shipments abroad.

TRADE NOTES FROM SCOTLAND.

(FROM OUR OWN CORRESPONDENT.)

The annual general meeting of the Kirkintilloch Gas Company was held last Thursday—Mr. Malcolm Maitland in the chair. From the report submitted, it was shown that there had been a total income of £3159 11s. during the past year; expended on repairs and extensions the sum of £1301 11s. 7d.; written off for depreciation on works and plant, £275 6s. 10d. The dividend declared for the half year ending the 15th of May was at the rate of 10 per cent. per annum on the paid-up capital, leaving a balance at credit of £131 19s. 5d. The value of the works at that date was £8903 4s. 5d. On the motion of the chairman, the report was unanimously approved of, and the vacancies in the board of directors were filled up.

At a meeting of the Kirkintilloch Police Commissioners held on Monday, the 11th inst., the Provost gave notice that at the next meeting he would move a resolution in favour of the adoption of the Burghs Gas Supply (Scotland) Act.

On Tuesday last a meeting of the Alloa Gas Company was held—Mr. Thomas Brydie presiding—for the purpose of taking into consideration an intimation made to the company by the Burgh Commissioners, that they were willing to treat for the purchase of the gas-works in accordance with the provisions of the Burghs Gas Supply (Scotland) Act, 1876. After the subject was considered at some length, it was agreed to dispose of the works by arbitration. The meeting also agreed to deduct 5d. per 1000 cubic feet of gas, thus reducing the price to 4s. 7d.

The annual meeting of the Dunoon Gas Company was held on Saturday week—Mr. Archibald Oswald, chairman of the company, presiding. A dividend of 10 per cent. was declared on the past year's business, and it was agreed to reduce the price of gas from 6s. 6d. to 6s. 3d. per 1000 cubic feet.

On Wednesday last the Kinross and Milnathort Gas Company held their annual meeting.—Mr. Robert Burns Begg presiding. The affairs of the company were found to be in a prosperous condition, but owing to the heavy expenses incurred in the erection of a new gasholder the directors did not feel themselves justified in recommending a dividend of more than 4 per cent., which was agreed to.

Dividends of 6 per cent., 7½ per cent., and 10 per cent., respectively have been declared by the Blairgowrie, Largs, and Galashiels Gas Companies.

The annual general meeting of the Perth Gas Commissioners was held on Monday, the 11th inst.—the Lord Provost presiding. A statement of the income and expenditure of the past year was laid on the table, and an estimate of the same for the ensuing year. The treasurer moved that the price of gas be reduced to 4s. 2d. per 1000 cubic feet, a price which, he said, was as low as that charged in any town in Scotland. Dundee made six times as much gas as Perth, and the price there was the same as that which he had moved. The reason why it was not lower he did not know. Mr. Sime seconded the motion, and said that there could not be much further reduction, but the price would be no higher. He hoped the treasurer would not fulfil a threat which he had made to give up office, so that they might get on as "swimmingly" in the future as they had done in the past.

[If the treasurer of the Perth Gas Commissioners were as diligent a reader of the JOURNAL OF GAS LIGHTING as he ought to be, and as every person occupying a similar position ought to be, he would have learned long ere this time that there are at least two towns in Scotland—Coatbridge and Galashiels—where the price of gas is only 3s. 9d. per 1000 cubic feet. Of course, I admit that Coatbridge is near the coal supply; but Galashiels is certainly quite as far from the cannel coal seams as Perth is.]

Mr. Thomas Meldrum, who has been manager of the gas-works at Kennoway, in Fifeshire, since their commencement, lately gave in his resignation. For the vacancy thus created there were a great many applications, and eventually, from a list of five candidates, Mr. Alexander Anderson, gas manager, West Wemyss, was elected to fill the post.

The Aberdeen Corporation Gas Committee have accepted tenders for the supply of 23,500 tons of gas coal for the city during the year ending the 30th of September, 1878, at a total cost of £25,116.

During the month of May the average illuminating power of the gas supplied to Broughty Ferry was 27·03 candles.

Glasgow Corporation Gas Annuities (9 per cent.) were negotiated last Thursday at a rise of £1, at 220.

The ordinary meeting of the Glasgow Corporation Water Committee was held on Monday, the 11th inst.—Mr. James Brown in the chair. From the minutes of the Sub-committee on Works it appeared that the quantity of water sent into the city and suburbs during the fortnight ending the 4th inst., amounted on the average to 34 million gallons per day, and that the quantity of water in store at that date was as follows:—In lochs, 124 days supply; in Mugdock reservoir, 14 days supply; in Gorbals reservoirs, 159 days supply. The minutes were approved of, and Mr. Robert Wilson, interim treasurer, was afterwards unanimously appointed treasurer and registrar, at a salary of £250 per annum.

At a meeting of the Dundee Water Commissioners, held last Thursday, a report was submitted showing that the revenue for the past year had been £32,400, and the expenditure £32,225. On capital account there had been expended during the year fully £15,000.

The Town Council of Port Glasgow had the water question under consideration at their last meeting. From the monthly statement of the superintendent of the water-works it transpired that there had not been the same quantity of water in store in the month of June since the year 1871, the quantity being equal to a supply for 93 days for all purposes, as against 79 last year. Bailie Hagart, convener of the Water Committee, moved—"That the council, as the Police Commissioners under the General Police (Scotland) Act, incorporated with the Port Glasgow Police Act, 1865, finding that the requirements of the burgh for water have outgrown the capacity of the works at Leperstone, hereby resolve to provide additional water supply for the burgh, and having fully considered the two schemes mentioned in the reports by Mr. Gale, C.E., Glasgow, the council further resolve that the Auchendores scheme, as detailed in Mr. Gale's report, be adopted; that the cost thereof, in terms of said report, be estimated at the sum of £15,803; that application be made to the Public Loan Commissioners under the provisions of the Public Health (Scotland) Act, 1867, and the Amendment Act, 1875, to meet the expenses of the new works, and also to repay the balance of the loan due to them on the present works, and the other sums borrowed for these works on mortgages, the whole loan to be applied for amounting to about £29,000; and that it be remitted to the Finance Committee to make the application and get the loan arranged." In moving the above, he said it would be agreed that such an increase was an absolute necessity. During many years back the inhabitants had been for a portion of the year on short allowance. When the present works were projected, they were estimated to furnish a supply for a town of 12,000 inhabitants. But they all knew that Port Glasgow had considerably exceeded that population. The motion was seconded by Mr. M'Bryde, and adopted, Mr. Fyfe dissenting.

It has been resolved by the Town Council of Paisley to avail themselves of the powers which they already possess for increasing their water supply.

The annual meeting of the Galashiels Water Company was held last Tuesday, when it was resolved to empower the directors to arrange for the winding up of the company at an early date, in view of the introduction of a general water scheme. A dividend of 10 per cent. was declared.

The opponents of the Perth Water Bill have intimated to the promoters that their opposition will be confined to the proposed amendment to the effect that the Police Commissioners be named as first commissioners under the Act instead of the present promoters.

The monthly meeting of the Kirkcaldy Water Commission was held on Tuesday night, when the superintendent's report was read. It showed that the average daily quantity of water sent into the district during the past month was 82,000 gallons (of which 20,000 were sent to Wemyss; 17,000 for public works) being 25 gallons per head to a population of 23,000. For the past month the rainfall was 2·02 inches, and for the corresponding month last year 1·25 inches.

During the past week the tendency of the Glasgow pig iron market has been decidedly downwards. A good deal of business has been done, and on Friday afternoon prices were at least 3½d. down, as compared with those of the previous Friday.

Some descriptions of coal are in good demand, but others are very dull and inactive. Supplies are large, and prices, if anything, are a little easier.

LIGHTING BY ELECTRICITY.

[Translated from the *Journal des Usines à Gaz.*]

M. Denayrouse has presented to the Academy of Sciences a note relative to the suppression of carbons in the production of the electric light. This invention, which has excited considerable attention, is due to M. Jablochkoff, and consists in introducing into the central circuit of an electro-magnetic machine, the interior wire of a series of induction coils, and in causing a spark from the induced current to pass on to a plate of kaolin placed between the two extremities of the exterior wire of each coil.

The electric current is first of all made to pass on to a kind of priming of greater conducting power disposed upon the edge of the plate of kaolin; this latter is heated, becomes red hot, and eventually luminous.

M. Jablochkoff hopes by this means to succeed in producing as many as 50 luminous focuses with a single electro-magnetic machine.

Such, briefly summarized, are the terms of the communication made by M. Denayrouse to the Academy of Sciences, and subsequently repeated by him at a sitting of the Society for the Encouragement of National Industry, at which we were present. We are thus enabled to speak of this invention with some knowledge.

We ought to say, at the outset, that the idea of M. Jablochkoff is very ingenious, and that the experiment is a very interesting one from a scientific point of view, and very pretty to see in a lecture-room; but we will add that it does not appear to us to possess any chance of success in practice. We shall give our reasons presently.

Let us commence by stating that M. Jablochkoff is not the inventor of the pretended *divisibility of the electric light*, as we cannot reasonably give this name to the production of several intense focuses with the same machine or the same pile. This pretended divisibility has no connexion with the *indefinite subdivision* of the light of gas.

The idea of the divisibility of the electric light belongs to Mr. King, whose English patent is dated Nov. 4, 1845, and it would be difficult to say whether that gentleman's process is not superior to that of M. Jablochkoff. The basis of the invention is the employment of metallic conductors, or continuous carbons, raised to a white heat by the passage of an electric current. When carbon is employed, the graphite from gas-retorts is brought into use, it being rendered incandescent in a tube in which a vacuum has been produced. When the current is of sufficient intensity, a certain number of lights may be placed in the same circuit, taking care that the power of the machines, or of the piles, shall be in proportion to the number of lights to be obtained. In this way what is called *lighting by incandescence* is produced.

This process had for a long time been forgotten, when M. Lodugvine a Russian physicist, invented a small lamp, constructed on the same principle, which was perfected by MM. Konn and Bouliguine. Then came the remarkable invention of M. Jablochkoff, upon which we are about to dwell at greater length, in analyzing the method of lighting the Magasins du Louvre, and the experiments made at the Society for the Encouragement of National Industry.

M. Jablochkoff's apparatus has been fitted up with the object of lighting the Salle Marengo, situated between the Rue de Rivoli and the Rue St. Honoré; this is effected by means of eight electric "candles," surrounded by globes, thickly painted a zinc-white colour to soften and diffuse the light, and provided with reflectors to direct it. These candles are composed of two parallel carbon points 0·004 of a mètre (0·15 inch) in diameter, and 0·12 of a mètre (4·72 inches) long, insulated by a plate of siliceous material; they are fixed upon two copper tubes, and fastened together by a tampon of asbestos. These points are brought into communication by means of a small piece of charcoal, which serves for the lighting of the candles.

The apparatus is set in operation by two of the Alliance Company's electro-magnetic machines, each equal to 250 Carcel lamps, and driven by two six-horse power steam-engines.

This part of the Magasins du Louvre is usually lighted by eleven gaseliers, having altogether 74 globe burners, each consuming about 100 litres (3·5 cubic feet) of gas per hour.

In order to compare the two modes of lighting, a visit must be paid on several consecutive evenings, not only to the Salle Marengo itself, but to the opposite footway in the Rue de Rivoli, in order to judge well of the effect.

The first thing that will be noticed is that the electric light is not in action every evening, and even when it is it never continues so for the entire evening. This observation is very important, because it is by not taking it into account that persons are led to bring forward imaginary net cost prices, giving the advantage to the electric light.

In fact, if the electric light is not in action every evening, it is either on account of certain inconveniences attending its use, or because the apparatus has to be repaired; but if, on the other hand, when the light is in action, it is only so for a portion of the evening, it is because it is not economic.

Now that simply results from the fact that the electric light is indivisible, while gaslight may be divided indefinitely. In fact, what takes place in an establishment like that of the Magasins du Louvre? At dusk the gas-burners are lighted, but are kept turned down to a small jet; as the evening advances they are opened in proportion to requirements. Similarly at closing time, when the public are no longer admitted, the shopmen and others require light for clearing away and arranging the goods, though this work does not necessitate the large consumption required when the establishment is full of customers. A certain number of lights are therefore extinguished, and the others lowered so as to obtain only the necessary amount of light. Finally, when the place is closed, light is still required for the clerks and cashiers, but a few jets only are necessary. Nothing of this kind is possible with the electric light, which is always at its highest illuminating power, or if not, expends almost as much carbon and motive power as though it were.

The consequence is that the gas-burners remain alight (small jets, it is true), even when the electric light is in action. Therefore double fittings and double expense are necessitated on the one hand, and on the other, the net cost per hour of the electric light cannot be arrrived at by calculating the interest and depreciation of the apparatus on the footing of a number of hours lighting equal to that of the lighting by gas, since these apparatus are in use for a portion only of this number of hours. Or rather the expense of the two methods of lighting must be compared not with the equality of light, which is absolutely of no signification, but by taking into account the fact that the superabundance of electric light during certain hours is quite useless, and consequently lost, since it cannot be lowered and the expense reduced.

It is somewhat difficult, for several reasons, to appreciate exactly the difference in intensity between the two methods of lighting. First of all, as we have just said, the gas is never entirely extinguished; then a large amount of light is furnished from the neighbouring galleries; lastly, the colour of the light is altogether different. However, by standing on the opposite footway, it will be noticed that with either system of lighting the articles and customers in the shop are equally well distinguished. It may be admitted, therefore, that the eight electric candles of M. Jablochkoff are equal to the 74 gas-burners; and in the case of the former giving a superior light, this extra light would be superabundant, since the idea of increasing the number of burners has never been conceived.

Let us then give the comparative net cost of the two systems of lighting:—

By Electricity.

(*Expenses of First Establishment.*)

	Francs.	Sterling.
Two probable 6-horse power steam-engines	12,000	£480
Two Alliance electro-magnetic machines	16,000	640
Conducting wires and M. Jablochkoff's apparatus	2,000	80
Total	30,000	£1200

Being, at the rate of 15 per cent. per annum, for interest, depreciation, and maintenance, 4500 frs. (£180).

By Gas.

	Francs.	Sterling.
74 burners, at 25 frs. each (including meter and service-pipes*)	1850	£74

Being, at the rate of 15 per cent. per annum, for interest, &c., as above 277 f. 50 c. (£11 2s.)

We will admit 500 hours lighting in the year for each system in operation separately.

By Gas.

	Fr. c.	Sterling.
Interest and depreciation	277 50	£11 2
74 burners, burning 100 litres (3·5 cubic feet) per hour for 400 hours, at 30 c. per cubic mètre (35·3 cubic feet)	888 00	35 10
74 burners, burning 50 litres (1·75 cubic foot) per hour for 100 hours, at 30 c. per cubic mètre	111 00	4 8
Total for the year	1276 50	£51 0

Being at the rate of 2 f. 55 c. (2s.) per hour.

By Electricity.

	Francs.	Sterling.
Interest and depreciation	4500	£180 0
Coal (1·50 kilogramme per horse power per hour, at 40 frs. per 1000 kilogrammes) for 500 hours	360	14 8
Stokers, 500 hours, at 50 c. per hour	250	10 0
Graphite points, at 36 c. per hour	180	7 4
Lubrication, at 13 c. per hour	65	2 12
	5355	£214 4

Being at the rate of 10 f. 71 c. (8s. 6d.) per hour. That is to say, the cost of lighting by either system is in the proportion of 1276·50 : 5355 = 100 : 419. The electric light, therefore, costs more than four times as much as gas.

If, on the other hand, we compare the two systems as they are now working in the Magasins du Louvre—that is to say, either gas alone, or the electric light concurrently with gas burning low for several hours, and burning alone for the remainder of the time—we arrive at the following figures:—

Gas Alone.

	Fr. c.	Sterling.
Annual expense, 500 hours, as above, or 2 f. 55 c. per hour	1276 50	£51 0

Gas and Electricity.

	Fr. c.	Sterling.
Interest, depreciation, and maintenance of fittings (gas)	277 50	£11 2
Ditto (electricity)	4500 00	180 0
500 hours lighting by gas (small jets)	555 00	22 4
200 hours lighting by electricity, at 10 f. 71 c. per hour, as above	2142 00	85 14
Total	7474 50	£299 0

Being at the rate of 14 f. 96 c. (12s.) per hour. That is to say, the cost of lighting by either system is in the proportion of 1276·50 : 7474·50 = 100 : 586. The mixed system of lighting is, therefore, more than five times as dear as the gas alone.

There are other inconveniences to be pointed out in M. Jablochkoff's system applied to the lighting of large retail establishments:—

1. The "candles," being composed of carbon which burns and of a siliceous matter which volatilizes, produce a white smoke, formed of very fine particles of silex, which, as is well known, has a very injurious effect upon the respiratory passages.

2. The "candles" have to be renewed evey half hour.

3. The white light produced by electricity, which, it is true, allows the stuffs to be seen in their natural colours, is very unfavourable for the selection of those stuffs when they are to be viewed by artificial light, whether it be gas, candles, or lamps. With regard to those that are to be seen by daylight, it is more simple to select them during the day.

Finally, the faces of the visitors wear a pallid hue; and upon this point it is necessary to take the opinion of the ladies, which is altogether unfavourable to the electric light.

A few figures will still further demonstrate the absolute impossibility of bringing the electric light into general use in an establishment like that of the Magasins du Louvre, which, however, appear to be the best adapted for the employment of this system of illumination. We have seen that the lighting of the Salle Marengo required 74 gas-jets, and that to replace these, two six-horse power steam-engines, driving two Alliance electro-magnetic machines, were required. Let us generously admit that this system of lighting replaces even 100 gaslights. Now, the Magasins du Louvre employ altogether 3000 lights, to replace which, therefore, a motive power of 360 horses and 60 of the Alliance Company's electro-magnetic machines would have to be employed. It will thus be seen that it would be necessary to erect a complete works, and the cost of the ground alone would render the application of this system of lighting impracticable.

We will conclude this article by quoting a few passages from a very interesting volume by M. Fontaine, on the subject of lighting by electricity.† This well-known electrician says, in page 126 of his work:

"Manufacturers who only pay 30 c. per cubic mètre for their gas, and who find their establishments sufficiently lighted with 20 burners, should not seek a more economic light, unless they keep their works going every night without interruption."

Then on page 226 he says: "We assert that, from a practical point of view . . . . notwithstanding the remarkable works of M. Jablochkoff, and the no less remarkable initiative taken by M. Denayrouse, there is no lighting system in existence at the present time (May, 1877) which is simple in application, or which could be recommended for a preliminary trial and *à fortiori* for definitive application."

* We do not speak of the value of the gaseliers, which is altogether independent of the lighting, and would be identical for the two systems, in the case of luxurious fittings being employed.

† "Eclairage à l'Electricité. Renseignements pratiques par Hippolyte Fontaine." Paris: Baudry. 1877.

Further on he says: "We believe that for such great efforts to be crowned with success, it will be necessary to discover a new source of electricity, or find a means of utilizing atmospheric electricity for industrial purposes."

Finally, on page 227, he says: "The error committed by inventors is in wishing to make the employment of their apparatus too general, and immediately talking of suppressing gas lighting. True, electricity has already an immense field of operations. But from thence to taking everywhere the place now occupied by gas is a distance which will very probably never be completely traversed. We have never so much admired *the facility of employment, the simplicity of fitting up, the indefinite divisibility, and the multiplicity of uses of gas*, as since we have been occupied with lighting by electricity."

We have never said anything else.

SOUTHWARK AND VAUXHALL WATER COMPANY.

The Half-Yearly Ordinary General Meeting was held at the Company's Offices, Sumner Street, Southwark, on Thursday, the 14th inst.—Mr. HENRY WHITING in the chair.

The following report and statement of accounts were presented:—

1. The directors beg herewith to submit to the proprietors the half-yearly statement of accounts of the company to the 31st of March, 1877, which have been duly certified by the public auditor appointed by the Local Government Board and by the auditors of the company.

2. During the past six months the working of the various departments of the company's business has been thoroughly investigated, and your directors have introduced many improvements in the conduct of the business, which they believe will greatly conduce to the prosperity of the company. Alterations have been made in the engineer's staff, which our chief officer assures us will enable him to carry out the whole of the details of his department with the greatest efficiency. The secretary's department has been entirely reorganized, and greater efficiency ensured in recording the minutes and correspondence of the board, and also in keeping, checking, and examining the company's accounts. A new department has been organized for the purpose of supervising the collection of the rates and placing the assessments in the company's rate-books. An alteration has also been effected in the system of collection, whereby your directors are enabled to exercise a more direct supervision over the collectors, and hope, when fully carried out, will ensure greater promptitude in the payment of rates, and diminish the amount of arrears and losses. In making these alterations, your directors have been actuated by a desire to disturb as little as possible the old servants of the company, and they received prompt assistance from all the officers and collectors in obtaining the details to enable them to efficiently deal with a very intricate and difficult business. Although they have established this new and important department of supervision, yet the saving of expense effected in many directions has enabled the board not only at once to diminish the working expenses of the various departments, but to provide for a further considerable reduction as the older officers retire from their duties.

3. With the ordinary staff and in the company's workshops important repairs and renewals are now executed at a greatly diminished cost, compared with similar work performed in former years. Care is taken to secure by tender the best stores and appliances at the lowest prices, and all old materials are returned to the company's premises, to be re-worked up or disposed of to the best advantage of the company.

4. The amount which has been directed by the Government auditor to be credited to capital is in accordance with the terms of his order, being replaced from revenue. Messrs. Harvey's claims against the company have been arranged, and will be in the same manner periodically paid off.

5. The report of Mr. Bateman on the Peckham works has been received, and shows that they are not in a condition to be brought into active service. Considerable alterations must be made before they will be available for the purposes for which they were designed and constructed.

6. The thorough cleansing, reinstating, and improving the filters at Battersea and at Hampton, though a heavy charge on the current revenue, is making satisfactory progress, and the engines, boilers, and works generally are being overhauled, and, where necessary, repaired and renewed, as before stated, by our own staff.

7. Your directors have received several communications from the inhabitants of Richmond respecting the water supply of the town, all of which have engaged their attention and consideration, and their replies have been such as to convey to them the company's desire to give a supply on fair and equitable terms. Arrears to a considerable amount are due for the last quarter's water supplied to Richmond, and your directors are taking legal advice as to the proper course for their recovery.

8. The increase in the income of the half year is satisfactory, the amount received being £71,498 9s. 5d., as against £68,343 12s. 3d. in the preceding half year, but your directors regret that in consequence of the extraordinary charges above referred to they can only recommend that a half year's dividend at the rate of 4 per cent. per annum on the ordinary stock and class D shares, 5 per cent. per annum on the preference stock and on the preference shares, and £4 10s. per cent. per annum on the new ordinary No. 1 shares of the company, be declared, payable on and after July 15, 1877.

9. In closing their report, your directors desire to express their satisfaction at the efficient manner in which the principal officers of the company are discharging their duties.

No. 1.—STATEMENT OF STOCK, SHARE, AND LOAN CAPITAL, *on March* 31, 1877.

Acts of Parliament authorizing the Raising of Capital.	Description of Capital.	Maximum Dividend Authorized.	Number of Shares Issued.	Nominal Amount of Shares.	Called up per Share.	Total Paid up.	Amount Issued, but not Paid.	Remaining to be Issued and Called up.	Total Amount Authorized.
8 & 9 Vict., cap. 69, 14, 1845	Ordinary stock.*	10 per cent.	3036	£100	£100	£303,600	..	..	303,600
15 & 16 Vict., cap. 158, 17, 1852	Ditto.*	10 ,,	3036	25	25	75,900	..	..	75,900
18 Vict., cap. 24, 11, 1855	Ordinary shares.	7½ ,,	1265	100	100	126,500	..	..	126,500
27 Vict., cap. 8, 4, 1864	Ordinary stock.*	10 ,,	1265	100	100	126,500	..	..	126,500
Ditto ditto	Ditto.*	10 ,,	590	100	100	59,000	..	..	59,000
30 Vict., cap. 5, 4, 1867	Ditto.*	10 ,,	518	100	100	51,800	..	..	51,800
Ditto ditto	Ditto.*	10 ,,	500	100	100	50,000	..	..	50,000
35 Vict., cap. 3, 3, 1872	Ordinary shares.	10 ,,	A 760	100	100	70,000	..	£160,000	230,000
					Ordinary ...	£863,300			
18 Vict., cap. 24, 11, 1855	Preference stock.*	5 ,,	1265	100	100	£126,500	..	..	126,500
30 Vict., cap. 5, 4, 1867	Ditto.*	5 ,,	1982	100	100	198,200	..	..	198,200
35 Vict., cap. 3, 3, 1872	Preference shares.	5 ,,	1700	100	100	170,000	..	..	170,000
					Preference..	£494,700			
					Total.....	£1,358,000		£160,000	£1,518,000
8 & 9 Vict., cap. 69, 18, 1845	Bonds.	..	..	..	..	87,000 }			120,000
Ditto ditto	Debenture stock.	..	..	..	..	33,000 }	..	..	
15 & 16 Vict., cap. 158, 18, 1852	Ditto.	..	..	..	..	112,000	..	..	112,000
18 Vict., cap. 24, 21, 1855	Ditto.	..	..	..	..	150,060	..	..	156,000
35 Vict., cap. 3, 6, 1872	Ditto.	..	..	..	..	49,981	..	50,019	100,000
					Total.....	£1,789,981	..	£210,019	£2,000,000

* Shares converted into stock in accordance with Companies Clauses Act, 1845—8 Vict., cap. 16, 4.

RATES OF INTEREST PAID ON MORTGAGES AND DEBENTURE STOCK.

	4	per cent. on	£2,000 0 0	mortgage.
£87,000	4½	,,	23,500 0 0	,,
	4½	,,	31,500 0 0	,,
	4¾	,,	30,000 0 0	,,
344,981	4½	,,	84,316 0 0	debenture stock.
	4½	,,	260,665 0 0	,,
£431,981			£431,981 0 0	

A—£4 10s. payable until June 30, 1877.

Dr. CAPITAL ACCOUNT. *Cr.*

—	Certified Expenditure to Sept. 30, 1876.	Expenditure during Half Year.	Total Expenditure to date of Account.	—	Certified Receipts to Sept. 30, 1876.	Receipts during Half Year.	Total Receipts to Date of Account.
To Expenditure on works to March 31, 1871	£1,437,110 4 6	..	£1,437,110 4 6	By Ordinary stock	£607,800 0 0	..	*£666,800 0 0
Lands, water-rights, quit-rents, and easements, acquired by the company; reservoirs, wells, pumps, shafts, conduit-pipes, and works for the collection or impounding and storing of water, including service reservoirs and filtering-beds	89,010 9 9	2,061 7 3	91,071 17 0	Ordinary share capital	255,500 0 0	..	*196,500 0 0
				Preference stock	324,700 0 0	..	324,700 0 0
				Preference share capital	170,000 0 0	..	170,000 0 0
				Mortgage capital	94,850 0 0	..	+87,000 0 0
				Debenture stock	336,631 0 0	£8,350 0 0	344,981 0 0
				Premiums received on shares issued	423 0 0	..	423 0 0
						£8,350 0 0	
Main and service pipes connected with the distribution of water	179,688 6 7	2,018 7 4	181,706 13 11	+Less mortgages paid off.	..	7,850 0 0	
Meters, fitting, and service works, including labour.	14,202 10 9	2,067 11 8	16,270 2 5				
Law and parliamentary expenses (promoting)	1,858 13 10	8 3 6	1,866 17 4				
Engineers expenses chargeable to capital	3,925 0 2	..	3,925 0 2				
Interest at 4½ per cent. on new ordinary share capital, 5 per cent. on new preference share capital, and 4¼ per cent. on debenture stock, raised per 11th section of 35 Vict., cap. 3	17,034 1 1	..	17,034 1 1				
	£1,742,829 6 8	£6,155 9 9	£1,748,984 16 5				
Excess of income received over payments	..	..	41,419 3 7				
			£1,790,404 0 0		£1,789,904 0 0	£500 0 0	£1,790,404 0 0

* Ordinary share capital to the extent of £59,000 has been converted into ordinary stock.

No. 3.—REVENUE ACCOUNT.

MAINTENANCE.							
To Maintenance and repair of impounding and service reservoirs, filtering-beds, works and pipes, or for obtaining and storing of water, including the cost of materials and labour			£433	9	10		
Maintenance and repair of mains, pipes, fittings, meters, and works connected with distribution of water, including the cost of materials, labour, and renewals		£3,240	3	0			
Repairs of engines, &c., at the several works, included in Messrs. Harvey's accounts		4,000	0	0			
			7,240	3	0		
Pumping and engine charges, including the cost of coals, wages, &c.			10,717	10	6		
Filtration, including cost of materials and labour			4,067	16	5		
Salaries of engineer, superintendent, and clerks, and wages of inspectors and turncocks			2,318	7	1		
Rents			49	5	0		
Thames Conservancy			500	0	0		
Rates and taxes			4,147	13	9		
						£29,469	5 7
MANAGEMENT.							
Allowance to directors			506	5	0		
Allowance to company's auditors			21	5	3		
Salaries of secretary, accountant, and office clerks			721	0	2		
Superannuation			147	3	9		
Commission to collectors			2,246	13	7		
Stationery, printing, and general establishment charges			1,062	17	8		
Law and parliamentary expenses			1,198	13	2		
Official auditor and water examiner			96	12	5		
						6,000	11 0
Balance carried to next account to provide for losses						3,500	0 0
Dividend and interest account for transfer of profits						35,629	14 5
						£74,599	11 0

By Balance brought from last account		£3,500	0	0			
Add surcharges on water-rental to Sept. 30, 1876		1,723	19	5			
					£5,223	19	5
Less allowances for empty houses	£1,924	5	7				
Ditto overcharges	493	9	9				
Ditto bad debts	716	14	3				
				3,134	9	7	
Difference between ascertained and estimated losses						£2,089	9 10
Water-rents accrued to the date of this account						72,438	3 11
Rents received						71	17 8
						£74,599	11 0

No. 4.—DIVIDEND AND INTEREST ACCOUNT.

To Interest accrued to March 31, 1877, on mortgage and loan capital						£9,622	15 8
Dividends paid on preference stock and shares to Dec. 31, 1876	£6,183	15	0				
Dividends accrued on preference stock and shares to March 31, 1877	6,183	15	0				
				12,367	10	0	
Balance applicable to dividend				17,758	19	0	
				£39,749	4	8	

By Balance brought from last account on Sept. 30, 1876				£23,657	16	2	
Less dividend declared for the half year at the rate of 4½ per cent. on ordinary stock or shares, and 4½ per cent. on new stock (A and B)	£19,422	0	0				
Less interest on temporary loan for revenue purposes, charged as dividend	125	2	6				
				19,547	2	6	
						4,110	13 8
Interest on deposits						8	16 7
Revenue account for profits transferred						35,629	14 5
						£39,749	4 8

No. 5.—STATEMENT OF THE LIABILITIES AND ASSETS (BALANCE-SHEET).

To Capital account—							
Amount received, as per account No. 2						£1,790,404	0 0
Revenue account—							
Provision for bad debts, as per account No. 3						3,509	0 0
Dividend and interest account—							
As per account No. 4						17,758	19 0
Unclaimed dividends						532	5 8
Outstanding tradesmen's accounts, &c., owing by the company						16,466	16 3
Temporary loans and interest on ditto						18,094	8 9
Interest accrued to March 31, 1877, on mortgage and debenture stock						8,916	12 3
Interest accrued to March 31, 1877, on preference stock						6,183	15 0
Deposit suspense account						6,000	0 0
						£1,867,856	16 11

By Capital account—							
Amount expended for works, as per account No. 2						£1,748,984	16 5
Water-rates and service accounts due to the company						72,438	3 11
Water-rates in hands of collectors for collection						1,349	10 10
Stock in hand—							
Pipes, meters, fittings, coal, and general stores						4,524	10 5
Suspense account						509	15 9
Cash at bankers			£1,515	3	9		
Less outstanding cheques			386	13	10		
						1,128	9 11
Cash in office						7	14 5
Deposit account						6,000	0 0
Income-tax						135	6 4
Capital suspense account						32,778	8 11
						£1,867,856	16 11

Subject to the sum of £32,778 8s. 11d., now in suspense, being made a charge against the accruing revenues of the company during the next four years, I hereby certify that I have examined the foregoing accounts, and find the same correct; and that the sum of £17,758 19s. is available for dividend on the ordinary stock and share capital of the company, amounting to £863,300.

ALLEN STONEHAM,
Auditor appointed under the Metropolis Water Act, 1871.

The CHAIRMAN said: Before I formally move the adoption of the report, I believe it will be acceptable to the shareholders that I give them a detailed account of the withdrawal of our water supply to Richmond, and also the reasons why we are obliged to return to the dividend of 4 per cent. In 1875 the Richmond Vestry applied to the Local Government Board for the loan of £28,000 at 3½ per cent. for the purpose of constructing works and a well to supply the town with water. Our then solicitors advised us to oppose this loan. I would ask you to remark that it was not a question of opposing the scheme of the vestry, but simply opposing their borrowing the money at 3½ per cent. We were, of course, unsuccessful, as I informed the then chairman that a most eminent lawyer had stated would be the case. We then placed our law business in the hands of Messrs. Bircham and Co., who were already solicitors to the East London Water Company, and who in previous parliamentary contests had been entrusted by the eight water companies to draw up the general brief applicable to all the companies. You can well imagine how difficult it was for these gentlemen to conclude satisfactorily a case commenced and carried out by other solicitors. However, the matter was closed at an expense of £1000, and as we had already paid our former solicitors £2580 the total law costs of Richmond were £3580, all paid out of revenue. The Vestry of Richmond having obtained the loan of £28,000, issued tenders for the necessary works, when our then chairman, considering that we had our pipes and distributing plant already laid in the town, and which plant would be useless if the vestry were to lay fresh mains and pipes, made the following offer to the vestry that we would take over the works and scheme of the vestry, and expend thereon £28,000, to see if a supply of water could be procured from the chalk (about which there was very great doubt); if successful, however, we would supply the town with chalk water through their present pipes; the well failing, that we would then continue our supply of river water as before. No notice was taken of this offer. By December, 1876, the vestry had completed laying the larger part of their mains, and had made great progress with their well. At this time one of the vestry distinctly told our collector that the company would never get the next rate, because no one would pay it. The fact was that the vestrymen felt confident that their supply would be ready before or by the 30th of March, when our six months collection would be made. This very man now owes three-quarters of a year's rates. It was bad enough to supply the town for three months without being paid, but we felt that it would be still worse to pump water for six months and get no return. Therefore, on the 15th of December, 1876, our engineer wrote to the vestry-clerk that "on the 13th of January, 1877, we shall discontinue the supply to Richmond," but with this proviso, "unless it is the wish of your vestry that we should continue the same, in which case I shall be glad, and in the most friendly spirit, to meet you for the purpose of arranging terms for the continuation of the water supply to the town of Richmond." To this we received the vestry-clerk's invariable reply: "I beg to acknowledge receipt of your letter." On the 28th of December the vestry issued a circular that they were ready to give an ample and efficient supply to the town, and invited the inhabitants to enter into an immediate contract to take their good, instead of the company's bad water. On the 2nd of January last they issued a further circular that 2200 inhabitants (very nearly all the town) had entered into the required contract, and that the vestry were now prepared to give the supply. On the night of the 13th of January we ceased our supply to the town. This was a Saturday, and our engineer was abused by the vestry-clerk for doing the necessary work at night. Had we severed the connexion during the day, we should have been told how wrong it was to deprive the poor of their water supply for Sunday, and that we were interrupting the traffic in the streets of Richmond, which are very narrow. On Monday, the 15th, the truth came out that the vestry had been most cruelly deceived by two builders, members of the vestry. These two persons had assured not only the vestry, but other persons outside, that it was physically impossible for the company to discontinue the supply to the town of Richmond without ceasing at the same time to supply Kew on the right hand and Petersham on the left. The vestry were not ready, and had no water to give the town; they relied on our not being able to cease the supply, and then they intended to have our water without paying for it. But now our former liberality to the town did us good service. To supply a drinking fountain on the Hill without charge we laid a special pipe from our main, 400 yards long, in order to give a constant supply. When, therefore, we disconnected Richmond from our main-pipe, we simply turned this pipe, destined for the fountain, into the Petersham pipe. The possibility of doing this was unknown to one of our turncocks, who had been induced by the vestry to leave our employ at a week's notice. This, gentlemen, is the true reason of the intensely angry feeling of the Richmond Vestry—that our engineer was clever enough to withdraw from Richmond, and yet continue to supply Petersham and Kew. On our part there has been every disposition to oblige the inhabitants. For instance, when a gentleman asked us to continue his supply, he was informed that it would not be to the company's interests to serve a single house; but again calling in the following week, he informed us his daughter was dangerously ill with scarlet fever, and that the vestry had no water. We immediately laid on a supply to his

house, and he wrote to tell me, "Your Southwark water restored her to health." Again, the chairman of another water company called upon me, and said that it made him most anxious as to the supply of water to the town in case of fire, and urged me to inquire of the vestry if they were prepared in such a contingency. I wrote the letter; I received no answer, and the chairman of the vestry at the following meeting said it was a most important question. Our present position is this: We gave Richmond a daily low service of 850,000 gallons, high service of 350,000 gallons, or a daily total of 1,200,000 gallons, for which we received £5531 a year, or 3d. per 1000 gallons. We have not received the major part of six months rate—viz., £2000, and yet our revenue shows an increase of £3154 for that period, which proves that we have found new customers, who appreciate and pay for the water we give them. The Richmond Vestry state that they are now giving a supply of 250,000 gallons a day to the town. Such is the history of Richmond. With regard to the return to the previous dividend of 4 per cent., a 4 per cent. dividend per annum requires for the half year £17,441, an additional ½ per cent. per annum for the half year £2000, or for 4½ per annum, £19,441. This half year we have had the following exceptional charges to pay off:—Messrs. Harvey's old account, £4000; re-making filters, £3000; Richmond law bill (which was left in suspense from last time because Mr. Stoneham was in doubt about passing it), £1000 which makes 1 per cent. per annum; cessation of supply to Richmond, £2760. Your directors recommend a dividend of 4 per cent., because the Government auditor has certified that there is a sufficient sum available to pay that rate. Your directors consider that it would be too severe on the present proprietors not only to pay debts contracted in former years, but in addition, at the same time, to provide a reserve-fund for future shareholders. As our engineer will make a report once a year only, I will touch on a few points connected with his department. Mr. Rumble has occupied the post of chief engineer for very nearly a year, and all the anticipations of the directors as to the advantages to be derived from his selection have been more than fulfilled. In his department 4000 letters have been written in the year, against about 100 in the same period of the late engineer's reign. Our complaints were about 1600, but are now reduced to about 400 a year, and these arise chiefly from the tenants neglecting to keep their fittings in good order. For the last six years we have paid Messrs. Harvey for repairs an average of £3930 per annum. We now do our engineering work in our own shop. During the last year, Mr. Rumble has only paid £220; the wages of two extra fitters at our works cost £200; tools and materials, say, £200—total, £620 against the former outgoing of £3930. For this sum our No. 1 engine has been thoroughly repaired, about three dozen large valves made equal to new, tools and plant made for pipe-laying, a great part of which we do ourselves, instead of by Messrs. Aird, and our works in general placed in a far better condition than they ever before were. We formerly made our own gas at Battersea, and this required three men at 26s. per week, or per annum £203; cannel coal, £100; making a total of £303. We now purchase our gas at 3s. 6d. per 1000 feet, which, we believe, will cost us £120, and effect a saving of £180 a year. Still referring to the engineer's department, I should tell you that, whereas formerly, when leaky valves were cut out, and broken pipes taken up, they were carried off by some one, and seen no more; the valves are now repaired in our shop, and the broken pipes sold for the benefit of the company. At Hampton Mr. Rumble has effected a great economy. Before his time filtered water was used for condensing at the new works—the quantity required being 500,000 gallons a day—at 3d. per 1000 gallons. This is £6 a day saved; or if not saved, it gives us this daily additional quantity of filtered water for the supply of our customers. The unfiltered water is also far better than filtered water for the condensers and boilers, the fur or incrustration, by using the former, being so much softer, and less in quantity. Our engineer at Hampton informs me that the old boilers, which have been working 20 years with unfiltered water, are in a better condition than the boilers of the new works, which have worked only nine years. One of our large consumers was paying us £250 a year for a 7-inch pipe, running night and day. This arrangement of our late engineer had been going on for six years. Mr. Rumble, feeling convinced that we supplied this at an actual loss, placed a test-meter on the establishment, and found that the average supply exceeded 200,000 gallons a day, which, at our lowest charge, amounts to over £1800 a year. The waste is now stopped, and the establishment uses, and is satisfied with, only 40,000 gallons a day. This enormous waste did them no good, and was ruinous to us. In addition to the increase of the revenue of £3155, an amount of £704, net profit, has been earned, and received from the engineer's department, for work never before so undertaken. This amount the Government auditor, however, decided should be put to the decrease of capital, so that, if not benefiting revenue directly, it does so indirectly, by reduction of capital. But we have earned £704 in addition to the £3155. For opening ground and making connexions, every penny paid is now received by the company, amounting, at the present time, to £1200 or £1500 a year, and it is likely to increase. Since our last meeting, we have proceeded to re-make our filters, both at Hampton and Battersea. Two of the large filters at Battersea will be divided, for convenience and economy in working, as our engineer says that no filter should exceed an acre. With regard to the Battersea land, when we last met the question of its sale was raised by one of the shareholders, and the only information I could then give was that it remained *sub judice*. The directors make no mention of this subject in their report, because it was only on Tuesday last, at 5 p.m., that our solicitor brought the offer from the General Investment Company, to whom we had contracted to sell the land, that they would waive all claim to the fulfilment of the contract for sale upon the return of the £6000 deposit, together with £1500, to cover their law and other costs out of pocket, and interest upon the deposit, which we have had for nearly a year, and which, at 5 per cent., came to £300. This the board have accepted rather than enter into litigation—at all times uncertain—though undoubted right was on our side. Upon this settlement I congratulate the shareholders. It now leaves the question of the Battersea land unincumbered, and will enable your directors to deal with this valuable site in such a manner as must be beneficial alike to the shareholders of the company and to the consumers in the company's district. With reference to the Peckham works, as already stated in the report, Mr. Bateman's opinion is in perfect accord with the previously expressed views of our present chief engineer. Considerable alterations will have to be made before filling them with water. Mr. Bateman's report recommends strengthening the walls inside, thus reducing the capacity. The matter having been referred back to our engineer, he has the subject under his most anxious consideration, and hopes to be able to devise some other method whereby their capacity may be maintained, and their stability and efficiency ensured at a less cost than the method first suggested by Mr. Bateman. Generally, while the directors regret to have to recommend for your adoption a smaller dividend, owing to the extraordinary charges which have accrued under the management of their late officers, they feel that better times must ultimately come, inasmuch as the revenue is fast increasing, and the expenses are diminishing, and the district and works in every sense are in better order; and when the cleansing of the filters is completed, there can be no doubt even the sensational articles of Dr. Frankland will cease, and your directors be enabled to show, at least, a 5 per cent. dividend for distribution. In conclusion, I ask you, when criticizing the work and labours of your directors, to remember that in succeeding to such a legacy as refunding from revenue to capital Messrs. Harvey's accounts for £32,000, and the cost of cleansing the filters, which has come upon us so suddenly, in addition to very many similar charges, time alone will enable you to profit by the increase of revenue and the more efficient working of the concern. I ask you to remember that we are not the people who originally endorsed the bill. I will now move—"That the report of the directors submitted to this meeting be received and adopted, and that, as recommended by the directors, the half-yearly dividends be declared payable on and after the 14th of July, at the rate of 4 per cent. per annum on the ordinary shares and the class D shares, 5 per cent. per annum on the preference shares, and 4½ per cent. per annum on the ordinary No. 1 shares." I may add that we have had a collector of the name of Wilson for 34 years. He has been a zealous servant of the company, and the directors propose to give him a retiring pension of £100 a year, and I shall ask your confirmation of the allowance. He worked up to the last, and just before he retired he was knocked down and robbed of £50.

Mr. VIALLS seconded the motion.

Mr. STURGE asked what the engineer estimated the necessary repairs at Nunhead would cost, in order to render the works sufficient. It was rather new to him to find that the Richmond Company belonged to the Southwark Company. He had thought they were a separate company with a distinct capital. He wished to ask whether there was any other claim besides Messrs. Harvey's which the official auditor considered had been misplaced, or whether the whole of the disagreeable business was now known. If, despite what was done at Richmond, more than £8000 should be available, would the excess over Messrs. Harvey's claim go to dividend, or would the Government auditor insist on its being paid back to capital?

Mr. BRADFIELD, referring to the accounts, said the rentals appeared to be more in the corresponding half year of 1876 than they were for the six months ending March, 1877. Did the receipts vary in this company as they did with other concerns?

A PROPRIETOR asked if there was still money owing to Messrs. Harvey, and how much had been paid to them since the proprietors first discovered that they were so largely indebted. He also wished to know if it was all paid under the certificate of the then engineer. He would also like to be informed how much money had been spent on the Peckham reservoir, and whether that was certified by Mr. Quick. Had any steps been taken to get the company recouped by Mr. Quick?

Mr. ATTWELL considered that the bad debts, £716 14s. 3d., formed a very large item. The commission to collectors was £2246 13s. 7d., or nearly 3 per cent. of the rental. If the other servants were paid in proportion, he did not wonder at the dividends being so small. About the misdeeds of the past, it appeared to him this was a case similar to that which took place with the Great Central Gas Company, where Higgs was allowed to take £72,000 without the directors knowing anything about it. If the same incapacity prevailed at this board, he thought the sooner an alteration was made the better. For a water company, with the capital of the Southwark Company, only to declare 4 per cent., showed a want of management and discernment, to say the least of it.

Mr. WRIGHT asked what amount of capital had been expended at Richmond on mains.

Mr. GLANDON hoped that the engineer would be very careful about the Peckham reservoir, after the condemnation of Mr. Bateman.

Mr. WHITE asked how many of the old directors who were cognizant, or ought to have been cognizant, of these goings on, still remained on the board. He could not understand how the directors could have gone on from year to year with their eyes shut, and not looking into the affairs of the company.

The CHAIRMAN said Mr. Bateman had only given a rough estimate of the repairs that would be required to be done at Nunhead. The present wall was only 18 inches thick from top to bottom, and Mr. Bateman recommended a lining all round it; whether it would cost £20,000 or £30,000 he did not say, as he was not exactly applied to for an estimate. The object of the directors, in asking him to go to Peckham, was to ascertain whether it would be safe to charge the reservoirs with water, because the inhabitants of Peckham had been seriously alarmed, and Mr. Bateman distinctly said that it would not be safe. Mr. Bramwell also went into the reservoirs, but declined to give any opinion. He very handsomely returned his fee of 20 guineas, and said: "I must decline to give any report upon the reservoirs." If he had believed that they were fit to be filled with water, could it be imagined that he would not have said so? Richmond originally was supplied by the Richmond Company, who drew their water direct from the Thames at Richmond Bridge. That water was never filtered, and the inhabitants were continually calling out about it. The Richmond directors got sick of the job, and applied to the Southwark Company to buy them up. The Southwark Company agreed to do so, and as the Richmond directors wished the purchase to be carried out very rapidly, £16,500 was given for the concern. The land upon which the old works stood, and the old engine, were sold for £1500, leaving the cost of the Richmond Water-Works £15,000, without filtering-beds, and without any appliances for properly supplying the town. The supply then became merged in the Southwark Company.

A PROPRIETOR: Was that by consent of the shareholders at a meeting?

The CHAIRMAN said it was unanimously approved by the shareholders, and at the time was supposed to be a most advantageous arrangement both for the town and the company. The agreement was that the money should be at once paid, and that parliamentary powers should be sought to confirm the purchase. Parliament, however, refused to sanction it. It was opposed by the town of Richmond, who wished to have a 4 per cent. rate instead of 5 per cent. That was a very unjust demand, considering that a part of the town was at an enormous elevation, and the cost of pumping there was at least 3s., if not 4s., per 1000 gallons. A second application was made to Parliament, and opposition was again offered to it, so that the company's lawyer said it was advisable to withdraw the Bill. When the vestry decided on making works for themselves, the company tried to prevent them, but everybody knew that they had no *locus standi*.

Mr. STURGE said if the Richmond people wanted to be supplied by the company, they ought to be willing to pay reasonably for it. As far as he could see, the original blunder was taking the works without first obtaining parliamentary powers. However, it might be more profitable to try and get some money from Mr. Quick.

The CHAIRMAN said there was no reason for blaming Mr. Quick on account of the Richmond job. That was an affair of the lawyers, and there could be no doubt that the then lawyers neglected their duty in not calling attention to the fact that if Parliament refused the powers, Richmond might at any time turn round and say, "We will not pay what we owe you." With regard to the Peckham reservoir, Mr. Rumble was anxiously considering whether he could not adopt a cheaper scheme than that recommended by Mr. Bateman, and in all probability he would succeed in doing so. In the case of Messrs. Harvey's claim, not only did the Government auditor require them to transfer £32,000 from revenue to capital, but there was also a bill for £10,200. Of that, £2000 odd had been paid off, leaving the debt £8871. A civil engineer, who was asked to inquire

into the reasonableness of Messrs. Harvey's charges, reported that they were far too high, and it was a subject of serious discussion at the board whether legal proceedings should not be taken. It was at last agreed to throw over the odd hundreds, and the remaining £8000 was to be paid off at the rate of £2000 a year with interest at 3 per cent.

A PROPRIETOR asked what work had been done for the money.

The CHAIRMAN said general repairs, and perhaps a little new work. He believed he might safely say that when that claim was extinguished no other charges would be brought forward. During the half year £71,000 had been received against £68,000 for the corresponding period last year, notwithstanding that the company had lost Richmond, and that Richmond at the present time owed them £2000, and the vestry £142. The directors were now investigating the question whether they could legally recover the amount. They were taking counsel's opinion about it, and the reason they discontinued to supply the town was that they were told distinctly that they would never get the present rate. If the Richmond people would offer to pay what they owed, and then wished for a supply in the hot weather, the company would be happy to give it. They had no ill feeling against Richmond; their duty simply was to get dividends for the shareholders.

A PROPRIETOR: Have we power in this company to make the consumers pay in advance?

The CHAIRMAN answered in the affirmative, but said in rich districts like Chelsea and West Middlesex the people sometimes asked to be allowed to pay in advance, as they might be going abroad; but Southwark was a poor district, and the great difficulty was to get the money when it was due. The money which had been paid to Messrs. Harvey was on the certificate of Mr. Quick. Nothing was ever paid by the directors except on the certificate of the engineers, but he (the chairman) had before proved that those certificates were not always correct. The question of whether any steps should be taken against Mr. Quick did not arise until the whole matter of the Peckham works was gone into. Mr. Rumble became the engineer in July last, and had been busy night and day since then, but it could not be said as yet whether it was the contractor or the engineer who was responsible. One gentleman had referred to the bad debts (£716) as being rather large; but the only concern he knew of that had succeeded in keeping bad debts at a lower figure was the Manchester Water-Works, the bad debts of which were only £200 a year. The amount paid as commission was £2476, which included £139 for the broker who got in the rates the last month out of the six. The collectors endeavoured to get in as much as they could, but at the end of five months the books were handed over to the broker. The collectors received from sixpence to ninepence in the pound. The difficulty of getting the water-rate was much greater than that of getting the gas-rate. £15,000 was paid for the Richmond works; £10,000 for the extension of mains, &c., there; £15,000 for a special main from the works at Battersea to Richmond. Then there was a provision for £10,000 for extra cocks, &c., which, however, had not been laid, and in point of fact the Richmond outlay stood in the company's books at about £60,000. In that was included a share of the filters, which produced a revenue of £5000. About £40,000 might be taken as the cost of the plant. Mr. Vialls, Mr. Carbonnel, and himself were the only three members of the present board who might be called old directors, having been on the board when things went wrong. At that time Sir William Clay was chairman. He was a very large holder of shares, and was virtually the dictator of the concern, and it was quite impossible for the other directors to oppose a person of such knowledge and standing in the company, for, of course, he could have carried anything. His chief confidential adviser was the late engineer, Mr. Quick. When Sir William Clay died, Mr. James Clay took his place. He was succeeded by Mr. Arthur Clay, and Mr. Quick was the adviser of both those gentlemen also, and the other directors simply endorsed whatever was proposed by the chairman. The secretary at that time was Mr. Robinson, but he had resigned; if he had not he would have been dismissed. Therefore, when it was asked, "Why did you not find out these things before?" his answer was, that when an engineer was paid £1200 a year, his son £600, and the secretary £1400, the board was justified in expecting that those gentlemen would work for the benefit of the company. Directly it was discovered that they had not done so, their resignations were accepted, and there had been a total reconstruction of the staff of the company. There was now not a single man on the staff who did not earn his money.

The resolution was unanimously agreed to.

The CHAIRMAN next proposed—"That this meeting sanctions the grant by the directors to Mr. Wilson, a collector in the employ of this company for 34 years, of a retiring allowance of £100 a year, during the pleasure of the board."

Mr. VIALLS seconded the proposal, which was agreed to.

Mr. BURT (solicitor to the company) said he was a member of the Richmond Vestry, and, in consideration of his peculiar position, the directors had been good enough to relieve him from personally advising them with regard to the Richmond dispute. In that matter, the company were advised by another gentleman, who was in no way personally interested in it.

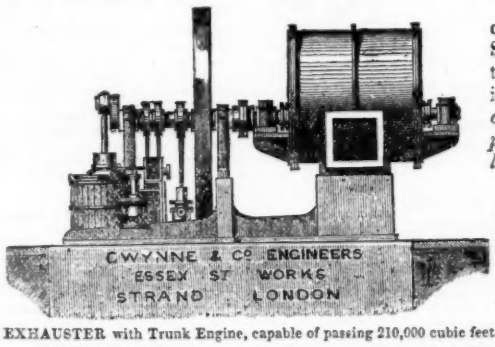
A vote of thanks to the chairman, directors, and engineer was agreed to.

Mr. RUMBLE thanked the shareholders for the compliment, but reminded them that it was to the directors that credit was due, it resting with him simply to carry out their desires. He said he should give due consideration to Mr. Bateman's suggestion with regard to the Peckham works, but it would be readily understood that it was less expensive to do the work outside than inside the reservoir.

The CHAIRMAN also acknowledged the vote, and the proceedings then terminated.

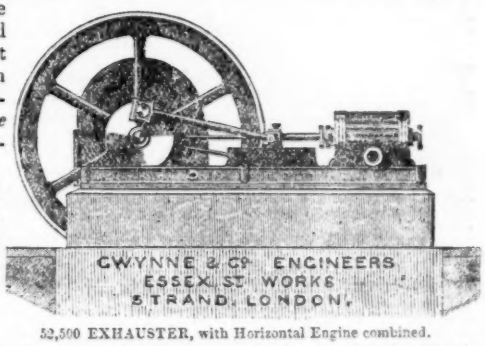
The GRAND MEDAL of MERIT at the VIENNA EXHIBITION, and TWO MEDALS at the PHILADELPHIA EXHIBITION, have been AWARDED to GWYNNE & CO. for GAS-EXHAUSTERS, ENGINES, and PUMPS;
Also 27 OTHER MEDALS AWARDED at all the GREAT INTERNATIONAL EXHIBITIONS.

GWYNNE & BEALE'S PATENT GAS-EXHAUSTERS & ENGINES.



The Judges report on the combined Exhauster and Steam-Engine exhibited at the Philadelphia Exhibition is—"*Reliable compact Machine, well adapted for the purpose intended, of excellent workmanship.*"

GWYNNE & CO. have made the largest and most perfect Gas-Exhausting Machinery in the world, and have completed Exhausters to the extent of 7,000,000 cubic feet passed per hour, of all sizes from 2000 to 210,000 cubic feet per hour.



EXHAUSTER with Trunk Engine, capable of passing 210,000 cubic feet per hour.

52,500 EXHAUSTER, with Horizontal Engine combined.

GWYNNE & CO. do not pretend to enter into a struggle with other makers in respect to cheapness. They have never sought to make price the chief consideration, *but to produce machinery of the very highest quality, and most approved design and workmanship.* The result is that in every instance their work is giving the fullest satisfaction. Numerous testimonials and references can be given to Companies using their Machinery for years past.

Exhausters, with or without Engines combined, can be made to pass the gas without oscillation or variation in pressure.
Regulators, Bye-Passes, Stop-Valves, Gas-Valves, Station Governors, and Gas Machinery of all Sizes.

PLEASE ADDRESS IN FULL, GWYNNE & CO., Hydraulic and Gas Engineers,
ESSEX STREET WORKS, VICTORIA EMBANKMENT, LONDON, W.C., ENGLAND.

☞ *G. & Co. are now making 6 Sets Exhausters and Engines for 105,000 cubic feet per hour, 3 Sets 180,000 Exhausters and Engines, with many others of all Sizes.*

Now ready, price One Shilling, No. 7 (to be continued Monthly) of

A TREATISE ON THE SCIENCE & PRACTICE
OF THE
Manufacture and Distribution
OF
COAL GAS.

LONDON: WILLIAM B. KING, 11, BOLT COURT, FLEET STREET,
OR OF ANY BOOKSELLER IN TOWN OR COUNTRY.

For the convenience of persons resident in remote districts, arrangements have been made by the Publisher to forward the "Treatise" by Post, securely packed on a roller, at the cost of the number and postage only—viz., 1s. 2d. Monthly, or 7s. for the Half Year.

GAS-WORKS CLAUSES AMENDMENT ACT, 1871.

ANNUAL ACCOUNTS
OF
GAS COMPANIES.

FORMS OF ANNUAL ACCOUNTS, arranged as required by the 35th Section of the Act (34 & 35 Vict., cap. 41), are now ready.

These Forms have been printed on large sheets of paper of the best quality, and are carefully ruled so as to afford the utmost facility for compliance with the provisions of the Act.

Price 3s. 6d. per dozen, free by post, or may be ordered of any Bookseller.

LONDON: W. B. KING,
11, BOLT COURT, FLEET STREET, E.C.

A Specimen Sheet on receipt of Six postage stamps.

WANTED, a steady Man, as Main and SERVICE LAYER, and to make himself generally useful at a Gas-Work. Constant employment.

Address, stating wages, references, &c., to No. 373, care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

WANTED, a Foreman Stoker for a small Gas-Work. Wages 30s. a week, with house, coals, and gas.

Apply (by letter only) to No. 374, care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

WANTED, a Gentleman—at present calling upon Gas Companies—to represent an old established firm of Provincial Gas-Meter Makers, on Commission.

Address No. 372, care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

WANTED, a situation as Draughtsman or CLERK of WORKS, by one who is well up in preparing Drawings and carrying out everything in connexion with Gas-Works. First-class testimonials and references.

Address No. 371, care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

WANTED, a situation as Inspector or ASSISTANT MANAGER of a Gas-Work, by a Young Man, aged 27. Five years in London, and Two years in a large provincial town as Inspector. Disengaged on the 20th of July.

Address No. 375, care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

WANTED, by a practical Gas Engineer, an engagement as ENGINEER and MANAGER. Advertiser is thoroughly experienced in all details of gas manufacture and distribution, the construction of works, and is a good draughtsman. Testimonials and references of the highest character.

Address No. 370, care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

A FIRM of Engineers, with good con- nexion at home and abroad, having central offices and a competent staff, wish to represent houses in the Engineering Trades, Railway, Gas and Water Branches.

Address MARSHALL AND CO., 26, Budge Row, Cannon Street, LONDON.

THE RATING OF GAS AND WATER WORKS.

A Gentleman of experience in the Rating of Properties of Public Companies is willing to undertake, in the interests of Companies, the Valuation of Gas and Water Works for Rating purposes.

Address, in first instance, No. 367, care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

FOR SALE, CHEAP, owing to exten- sions, Three PURIFIERS, with valves and connexions, in good order.

Apply to the Gas Company, NORTHALLERTON.

FOR SALE—Hydraulic Main, 18 in. diameter, with ascension and dip pipes complete, for five benches of retorts, suitable for a small Gas-Works.

Apply to SECRETARY, Gas and Coke Works, DEVONPORT.

FOR SALE—A Set of Four Purifiers, 8 ft. by 6 ft., with covers, grids, centre-valve, and 6-in. connexions complete.

Apply to J. GILL, Gas-Works, BRIDGNORTH.

READING GAS COMPANY.

FOR SALE, as they now stand, and at any reasonable price, as the ground upon which they stand is wanted, four 12-ft. square Cast-Iron PURIFIERS, with centre-valve and connexions, grids, tee bars, &c., complete.

Apply to Mr. E. BAKER, Engineer, Gas-Works, READING.

GOVERNOR FOR SALE.

THE Newmarket Gas Company have for immediate SALE a 6-in. GOVERNOR in excellent condition by H. Balfour and Co. (1875); also a 6-in. Anderson's Four-Way VALVE.

Apply to THOMAS WILKINSON, Manager, Gas Company, NEWMARKET.

TO GAS MANAGERS AND OTHERS.

A MOST useful Lot of Second-hand APPARATUS FOR SALE, including Two 7 ft. square Purifiers, 6-in. Centre-Valve, Condenser, with 6-in. valve and bye-pass, &c., &c.

Full particulars to be had of Mr. GEO. THORNELOE, Engineer, 57, Barbican, LONDON, E.C.

The above may be seen at the Gas-Works, Basingstoke, by applying to Mr. THOMAS, Manager.

THE Newport (Mon.) Gas Company have FOR SALE the following PLANT at their Works, Newport, Mon.:—

Two Cylindrical Boilers, 13 ft. by 4 ft., with fittings complete, and steam-pipes to engines.

Two Horizontal Engines, each cylinder 9½ in. diameter, and stroke of each 1 ft. 6 in.

Two Beale's Exhausters, made to pass 20,000 cubic feet per hour each, with regulators and bye-pass.

The above are in good order, have been working during the past winter, and are now offered for sale because larger ones have been fixed.

Particulars and prices given for the whole or a portion of the Plant on application to the undersigned.

They can be seen at the Works, Mill Street, Newport, Mon.

THOMAS CANNING, Engineer.

May 18, 1877.

THE Newmarket Gas Company invite TENDERS for the supply of a 9-in. GAS GOVERNOR, and a 9-in. Four-Way VALVE, delivered at Newmarket Railway Station.

Tenders to be sent to the undersigned on or before the 5th day of July next.

The Directors do not bind themselves to accept the lowest or any tender.

By order,
THOMAS WILKINSON, Manager.

GASHOLDER FOR SALE.

ONE Telescopic Gasholder, 70 feet by 20 feet, complete, with cast-iron tank, columns, girders, and inlet and outlet pipes, valves, &c., of modern construction. In first-class condition, and made by Messrs. Pigott and Co., of Birmingham.

To be seen at work at the Gas-Works, Birkenhead.

Cause of removal to make room for extensions.

To be sold a bargain, taken down, and re-erected ready for work.

For particulars, apply to Messrs. ASHMORE AND WHILE, Stockton-on-Tees, or to view to Mr. CALLOW, Gas Engineer, BIRKENHEAD.

TO PERSONS OR PARISHES ABOUT TO ESTABLISH GAS-WORKS.

THE whole of the fixed Plant of Works in the country, about 40 miles from London, to be DISPOSED OF in consequence of their being too small for the Company, who have had to erect larger ones.

The Plant consists of Two Holders, one 30 ft. diameter, and one 27 ft. diameter, each 10 ft. deep; Three Sets of Modern Purifiers, Condensers, Hydraulic Mains, Washer, &c.

The above would be admirably adapted for a small town or village, as most of it is in good order, the purifiers and one holder being of comparatively recent erection.

Applications to view and treat to be made to Messrs. CONDER AND SONS, Estate and Land Agents, Auctioneers, &c., Biggleswade, BEDS.

TO CONTRACTORS AND OTHERS.

THE Directors of The Gaslight and Coke Company are prepared to receive TENDERS for the undermentioned GOODS, viz.:—Portland Cement, Grey Lime, Sand, Wrought-Iron Tubing and Fittings, Oils, Tallow, White Lead, in accordance with specifications to be obtained at this office.

Proposals to be sent in on or before Thursday, the 28th inst.

By order,
JOHN ORWELL PHILLIPS, Secretary.

Chief Office: Horseferry Road, Westminster, S.W.,
June 16, 1877.

TO BRICKMAKERS AND OTHERS.

THE Directors of The Gaslight and Coke Company are prepared to receive TENDERS for the purchase of the BREEZE manufactured at several of their stations in accordance with a specification to be obtained at this Office.

Proposals to be sent in on or before Thursday, the 28th inst.

By order,
JOHN ORWELL PHILLIPS, Secretary.

Chief Office: Horseferry Road, Westminster, S.W.,
June 16, 1877.

WHITCHURCH AND DODINGTON GASLIGHT AND COKE COMPANY, WHITCHURCH, SALOP.

TENDERS for the year's supply of Gas COAL, from 800 to 900 Tons carbonized, may be sent to the Company on or before the 26th day of June inst.

G. T. JOHNSON, Secretary.

TO MAIN LAYERS.

THE Directors of the Hungerford Gas Company are prepared to receive TENDERS for the laying of about 400 yards each size of 5 in., 3 in., and 2½ in. MAINS, and other works in connexion.

Further particulars may be obtained on application to the Secretary.

Tenders to be sent in on or before the 30th day of June, 1877, addressed to the Chairman of the Hungerford Gas Company.

J. H. WOOLDRIDGE, Secretary.

GLASGOW CORPORATION GAS.

RESIDUAL PRODUCTS FOR SALE.

THE Gas Committee of the Glasgow Corporation Gas Commissioners are prepared to receive TENDERS for the purchase of the TAR and AMMONIACAL LIQUOR produced at the Tradeston Gas-Works, from and after Nov. 11, 1877. The contract to be for such number of years as may be agreed upon.

Forms for tender, on which offers must be made, may be had, and further particulars obtained, on application to the Manager, at the Gas Office, 42, Virginia Street, Glasgow, and offers, endorsed "Tender for Residual Products," will be received by the subscriber up till the 10th of July next.

The Committee do not bind themselves to accept the highest or any tender.

J. D. MARWICK, Town-Clerk,
Clerk to the Commissioners.

City Chambers, Glasgow, June 12, 1877.

TO CONTRACTORS, GASHOLDER MAKERS, TANK BUILDERS, AND OTHERS.

THE Directors of the Rye Gas and Coke Company, Limited, invite TENDERS for the following WORKS:—

No. 1.—For the construction and erection of a Gasholder, about 52 ft. diameter, and 17 ft. high.

No. 2.—For the construction of a Brick Tank for the same at the Company's Works at Rye.

Parties tendering for either or both contracts can inspect plans and specifications between the hours of Ten a.m. and Four p.m. at the Office of Messrs. Messer and Thorpe, Engineers, 8, Quality Court, Chancery Lane, London.

Tenders must be sent in on or before Monday, the 25th day of June inst., endorsed "Tender for Gasholder and Tank," and addressed the Secretary, Watchbell Street, Rye, Sussex.

The Directors do not bind themselves to accept the lowest or any tender.

By order,
G. SLADE BUTLER, Secretary.

Rye, June 5, 1877.

TO GAS APPARATUS CONTRACTORS AND BUILDERS.

THE Crediton Gaslight and Coke Com- pany are prepared to receive TENDERS for the construction of a Brick GASHOLDER-TANK and GASHOLDER at their Works.

Plans and specifications may be seen, and full particulars obtained, on application to Thomas Dand, C.E., Post-Office Chambers, Exeter.

Tenders are to be sent in on or before Saturday, the 30th day of June inst, endorsed "Tender for Gasholder, also for Brick Tank," addressed to the undersigned.

The Directors do not bind themselves to accept the lowest or any tender.

W. SNOW, Secretary.

Crediton, Devon, June 11, 1877.

THE Directors of the Chelsea Water- Works Company invite TENDERS for providing, laying, and jointing in their district about 1800 yards of 18-in., and 2500 yards of 12-in. Straight and Irregular Cast-Iron PIPES.

The specifications and drawings can be seen at the Company's Office, No. 35, Commercial Road, Pimlico, London, any day after Monday, the 18th June inst., between the hours of Ten and Four.

Tenders, addressed to the Secretary, are to be sent in to the Company's Office before Ten o'clock on Thursday, the 28th inst.

The Directors do not bind themselves to accept the lowest or any tender.

By order,
ALBERT GILL, Secretary.

TO CONTRACTORS FOR GAS-WORKS.

THE Smethwick Local Board of Health are prepared to receive TENDERS for the construction of Two Brick GASHOLDER-TANKS, 87 ft. diameter, according to the plans and specifications of F. J. Bramwell, Esq., M.Inst.C.E., which, with the form of tender, may be seen at the Offices of the Local Board Public Buildings, Smethwick, on and after the 20th of June, 1877, and between the hours of Ten o'clock a.m. and Four o'clock p.m.

Tenders must be sent to the undersigned not later than the 23rd day of July, 1877.

RALPH DOCKER, Clerk to the Local Board.

Public Buildings, Smethwick, near Birmingham,
June 11, 1877.

TO GASHOLDER MANUFACTURERS.

THE Smethwick Local Board of Health are prepared to receive TENDERS for the construction of Two TELESCOPIC GASHOLDERS, 85 ft. diameter, with their standards, &c., &c., according to the plans and specifications of F. J. Bramwell, Esq., M.Inst.C.E., which, with the form of tender, may be seen at the Offices of the Local Board Public Buildings, Smethwick, on and after the 20th of June, 1877, between the hours of Ten o'clock a.m. and Four o'clock p.m.

Tenders must be sent to the undersigned not later than the 23rd day of July, 1877.

RALPH DOCKER, Clerk to the Local Board.

Public Buildings, Smethwick, near Birmingham,
June 11, 1877.

TO LAMP-PILLAR MANUFACTURERS.

THE Rural Sanitary Authority of the King's Norton Union are desirous of receiving TENDERS for the supply, within a limited period, of 205 LAMP-PILLARS, ready for the fitting on of the lanterns, the pillars to have received one coat of paint, and to be delivered free of charge at Moseley, King's Heath, and Selley Oak, in such number at those places as the Board may direct.

Tenders may be forwarded to me not later than on Tuesday, the 26th day of June, 1877, accompanied by drawings of the several designs manufactured, and stating within what period the lamp-pillars can be supplied. The tenders will be opened on Wednesday, the 27th day of June, 1877, at Two o'clock p.m.

By direction,
RALPH DOCKER, Clerk.

Union Buildings, Selley Oak, near Birmingham,
June 13, 1877.

TENDERS FOR GAS COAL.

THE Corporation of Walsall invite TENDERS for the supply of 20,000 Tons of Staveley, Yorkshire, or any other good GAS COAL, to be delivered, during One year, from the 1st of August next, either at Walsall Railway Station, or by boat at Walsall Old or New Gas-Works. In the latter case it will also have to be unloaded and stacked in the coal-shed, or such other place at the Gas-Works as may be directed. The Coal will have to be delivered at the rate of from 180 to 700 Tons per week, as the Corporation may from time to time require.

The weight, if delivered by rail, must be 2352 lbs. to the Ton; if by boat, it must be 22 cwt. to the Ton, boat gauge.

Payments monthly.

The Corporation do not bind themselves to accept any tender, and they reserve the right to divide the contract between several firms.

Tenders, sealed, and marked outside "Tender for Gas Coal," and stating the price for large Coal, and also for Nuts, are to be sent to the undersigned, on or before Thursday, the 28th of June inst.

SAMUEL WILKINSON, Town-Clerk.

Bridge Street, Walsall, June 6, 1877.

PAMPHLET ON GAS.

COOKING AND HEATING.

HINTS ON GAS-BURNERS, &c.

For GAS COMPANIES to distribute to their Gas Consumers.

Specimen Copy by post Threepence, from the Author,
MAGNUS OHREN, Gas-Works, Sydenham, S.E.

Just Published, Price 2s. 6d.,

COMMON SENSE FOR GAS USERS,

Being a Catechism of Gas Lighting for Householders, Gas-Fitters, Architects, Engineers, Millowners, &c.

By ROBERT WILSON, C.E.

CROSBY, LOCKWOOD, & CO., 7, STATIONERS HALL COURT, E.C.

Now ready.

THE GAS & WATER COMPANIES DIRECTORY
FOR THE YEAR 1877,

EDITED BY

CHARLES W. HASTINGS,

8, BUCKINGHAM STREET, ADELPHI, LONDON, W.C.

THIS WORK IS UNDER THE PATRONAGE OF ALL THE LEADING GAS & WATER ENGINEERS AND SECRETARIES OF THE METROPOLITAN & PROVINCIAL COMPANIES.

Price 5s. in Cloth Covers; by post, 5s. 2d. | Price 3s. 6d. in Paper Covers; by post, 3s. 8d.

PUBLISHED BY MESSRS. MARCUS WARD & CO., OF LONDON AND BELFAST.

JAMES MILNE & SON,

GAS ENGINEERS,

Gas-Meter, Gas Apparatus, and Gas-Fittings Manufacturers,

EDINBURGH, AND

2, KING EDWARD STREET,

NEWGATE STREET, LONDON.

Meter Works in London—2, CROSS STREET, WILDERNESS ROW, E.C.

STATION-METERS, GOVERNORS, CONSUMERS METERS, GAS LUSTRES, CHANDELIERS, BRACKETS, &c.,

And every description of Gas-Fittings and Gas Apparatus.

J. T. B. PORTER & CO.,

GAS ENGINEERS & MANUFACTURERS,

IRONFOUNDERS AND CONTRACTORS,

GOWTS BRIDGE WORKS,

LINCOLN.

LONDON OFFICES: 1, WESTMINSTER CHAMBERS, S.W.

ESTIMATES FOR GAS-WORKS OF ANY SIZE.

REFERENCES TO 500 WORKS ALREADY ERECTED.

N.B.—All Communications to be addressed to the FIRM ONLY.

TO GAS COMPANIES.

WE beg to call attention to our special STEATITE BURNERS for Street Lamps. Sample gross 8s. Quotations for quantities.

Messrs. TINDALL AND TELLING, Gas Apparatus Works, 74, Wynford Road, Penton Street, LONDON, N.

TO COLLIERY PROPRIETORS, COAL MERCHANTS AND OTHERS.

THE Directors of the Stratford-upon-Avon Gas Company invite TENDERS for the supply of 2000 Tons of good screened GAS COAL, to be delivered free upon their siding, Great Western Railway Company, in monthly quantities as may be required, between the 1st of July, 1877, and the 30th of June, 1878.

The Coal to be of good quality, and free from bats, bind, pyrites, and other refuse.

Parties tendering to state the kind of Coal, and from what district and pits obtained.

Terms of payment, net cash monthly.

Tenders to be sent in not later than Monday, July 2, 1877.

The Directors do not bind themselves to accept the lowest or any tender.

J. S. CRAMMER, Secretary.

June, 1877.

MAIDSTONE GAS COMPANY.

TO CONTRACTORS AND BUILDERS.

CONTRACT No. 1.

THE Directors of the above Company invite TENDERS for the building of a RETORT-HOUSE, 150 ft. long, 68 ft. wide, and 26 ft. high; also Two COAL STORES, 150 ft. long, 40 ft. wide, and 16 ft. high.

Drawings and specification and form of tender can be seen at the Gas-Works, Maidstone, on and after Tuesday, the 12th inst., and further particulars obtained from Mr. John West, the Company's Engineer.

Sealed tenders to be sent in on or before Wednesday, the 20th inst., addressed to the Chairman of the Company, Gas-Works, Maidstone, and endorsed "Tender for Retort-House and Coal Stores."

The Directors do not bind themselves to accept the lowest or any tender.

By order,

BEALE AND HOAR, Clerks.

Maidstone, June 5, 1877.

MAIDSTONE GAS COMPANY.

TO ENGINEERS AND CONTRACTORS.

CONTRACT No. 2.

THE Directors of the above Company invite TENDERS for the supply and erection of a Wrought-Iron ROOF for a new Retort-House, 150 feet long and 68 feet wide.

Drawings and specification, and form of tender, can be seen at the Gas-Works, Maidstone, on and after Tuesday, the 12th inst., and further particulars obtained from Mr. John West, the Company's Engineer.

Sealed tenders to be sent in on or before Wednesday, the 20th inst., addressed to the Chairman of the Company, Gas-Works, Maidstone, and endorsed "Tender for Wrought-Iron Roof."

The Directors do not bind themselves to accept the lowest or any tender.

By order,

BEALE AND HOAR, Clerks.

Maidstone, June 5, 1877.

NOTICE OF REMOVAL.

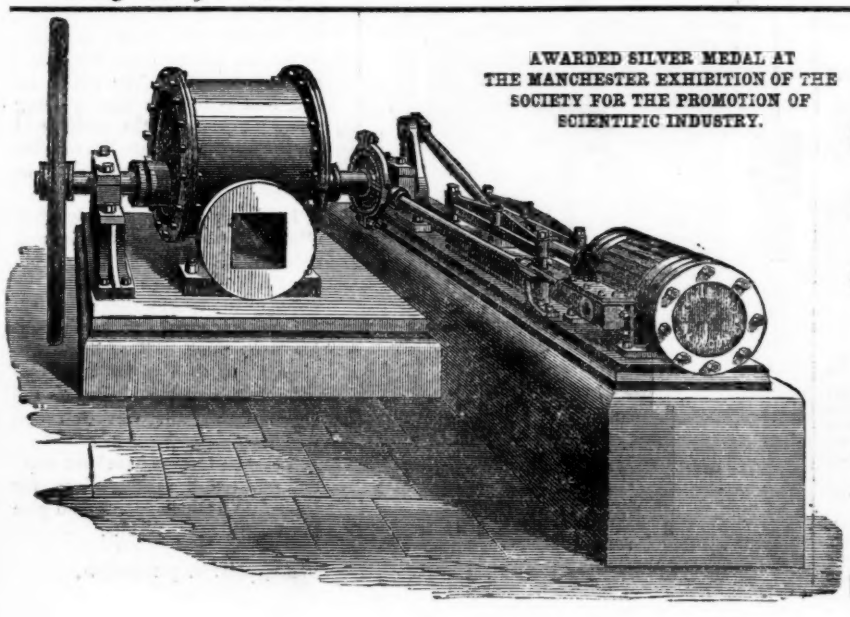
D. BRUCE PEEBLES & CO.

Beg to announce that they have REMOVED to their New Premises,

TAY WORKS, BONNINGTON, EDINBURGH,

To which all communications should now be addressed.

May 30, 1877.



AWARDED SILVER MEDAL AT THE MANCHESTER EXHIBITION OF THE SOCIETY FOR THE PROMOTION OF SCIENTIFIC INDUSTRY.

BEALE'S

Improved Patent

GAS-EXHAUSTERS

WITH

ENGINES COMBINED.

Sole Makers,

GEORGE WALLER & CO.

Makers of

ENGINES, EXHAUSTERS,
INDEX and DISC GAS-VALVES,
HYDRAULIC MAIN VALVES,
BYE-PASS VALVES,
TAR, LIQUOR, and other PUMPS
SCRUBBERS and PURIFIERS,
CONDENSERS, BOILERS, &c.

PHŒNIX ENGINEERING WORKS,

HOLLAND STREET, S.E.

BELFAST CORPORATION GAS-WORKS.

THE Gas Committee of the Belfast Corporation invite TENDERS for a year's supply (50,000 Tons) of Best GAS COAL, delivered at the New Crane Wharf, on the Blackstaff River, free of all charges, in the following Monthly Quantities:—

1877.—July	1,500	tons.
„ August	2,000	„
„ September	3,500	„
„ October	5,500	„
„ November	7,000	„
„ December	8,000	„
1878.—January	6,500	„
„ February	5,500	„
„ March	4,000	„
„ April	2,500	„
„ May	2,000	„
„ June	2,000	„
	50,000	tons.

Should parties offering so desire, they may tender for delivery into barges at the quays.

Tenders, endorsed "Tender for Coal," must be sent, addressed to James Guthrie, Esq., Town-Clerk, on or before the 2nd of July.

By order of the Committee,
JAMES STELFOX, Manager.

T. NEWBIGGING,
CONSULTING GAS ENGINEER,
5, NORFOLK STREET, MANCHESTER.

TO INVENTORS AND PATENTEES.

MR. W. H. BENNETT, having had considerable experience in matters connected with Gas, Water, and Sanitary Improvement, begs to say that he continues to assist Inventors in the perfection of their designs, and to obtain for them PROVISIONAL PROTECTION, whereby their invention may be secured for Six Months; or LETTERS PATENT, which are granted for Fourteen Years.

Patents completed, or proceeded with at any stage, thereby rendering it unnecessary for persons resident in the country to visit London.

Patents procured for Foreign Countries.

Information as to cost, &c., supplied gratuitously upon application to the Advertiser, 22, Great George Street, WESTMINSTER.

CATHELS'S Patent District Dry Gas-GOVERNOR is the only perfect self-acting contrivance for Regulating the Pressures in the higher levels of a district.

For prices, &c., apply to the Manufacturers, Messrs. GUEST AND CHRIMES, ROTHERHAM.

CATHELS & TERRACE'S Patent Four-WAY DISC GAS-VALVE is the simplest and best Valve for Purifiers, and as a By-pass for other apparatus in Gas-Works. It is always gas-tight, and has no springs, ground faces, or other delicate parts. By its use the flow of the gas cannot be accidentally stopped, and it never sticks.

For prices, &c., apply to the Manufacturers, Messrs. GUEST AND CHRIMES, Foundry and Brass Works, ROTHERHAM.

CATHELS'S Improved Retort-Settings, Guaranteed to heat and wear well, with great economy of Fuel.

Coloured lithograph copies of Working Drawings of Beds of One to Seven Retorts (so clearly arranged and fully shown as to be easily understood by any retort setter or bricklayer) having been made of these valuable settings, they can now be supplied with detailed Specification immediately on receipt of orders.

Apply to Mr. THOS. NEWBIGGING, Consulting Gas Engineer, 5, Norfolk Street, MANCHESTER.

Now ready, price 7s., by Post 7s. 3d.,
A SECOND EDITION (fcap. 8vo., morocco gilt)
OF
THE GAS MANAGER'S HANDBOOK,
CONSISTING OF
Tables, Rules, and Useful Information for Gas Engineers, Managers,
And others engaged in the Manufacture and Distribution of
COAL GAS.
By THOMAS NEWBIGGING, A.I.C.E.

WILLIAM B. KING, 11, BOLT COURT, FLEET STREET, LONDON, E.C.

CONSPIRACY AND PROTECTION OF PROPERTY ACT, 1875.

It is required, under a PENALTY OF FIVE POUNDS, that a PRINTED COPY of the 4th SECTION of the above Act shall be posted up at all Gas and Water Works in a conspicuous place, where the same may be conveniently read by the persons employed thereat.

Printed copies of the section, in large type, on broad sheets, may be had of WILLIAM B. KING, 11, Bolt Court, Fleet Street, LONDON. Price, per post, 2s. per dozen, or 10s. 6d. per 100.

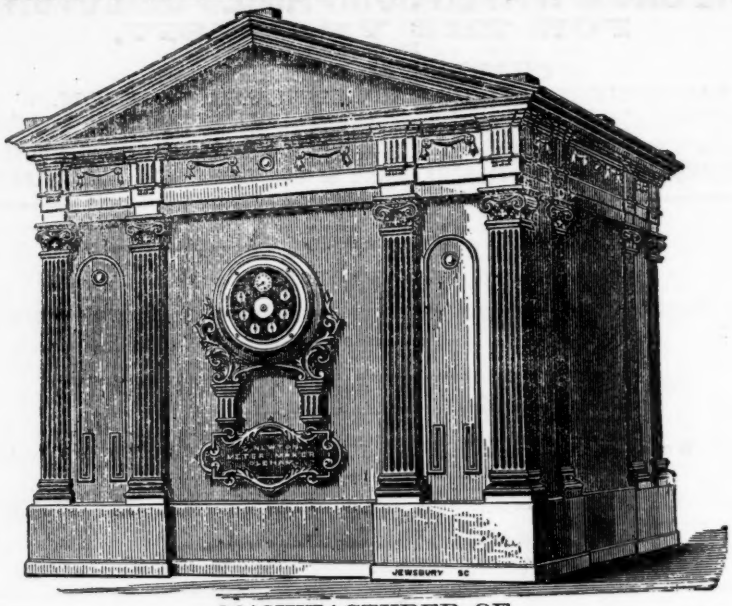
The Act extends to Scotland and Ireland.

NOW READY,
THE
GAS COMPANIES EXPENDITURE JOURNAL,
Being a Ruled Account-Book with Printed Headings, and Analyzing Guide for Keeping, upon the easiest and most correct method, the Expenditure of a Gas Company, in accordance with the provisions of the Gas-Works Clauses Act of 1871, and suitable for all Companies.

Prices, half bound, cloth sides, 2 quires, 30s.; 3 quires, 36s.; other sizes and bindings to order.

Published by EDWARD SANDELL, Accountant, 4, Skinner's Place, Size Lane, QUEEN VICTORIA STREET, and W. B. KING, Office of the JOURNAL OF GAS LIGHTING, 11, Bolt Court, FLEET STREET, E.C.

GEORGE NEWTON,
UNION STREET WEST, OLDHAM,



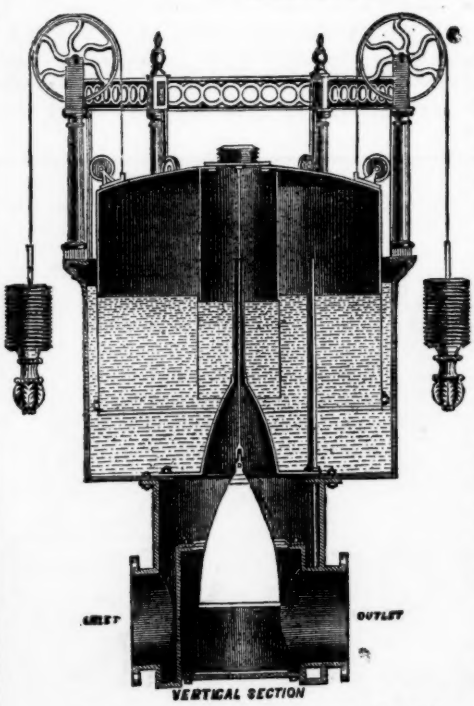
MANUFACTURER OF
SQUARE STATION-METERS, with PLANED JOINTS;
ROUND STATION-METERS, WITH CAST-IRON STANDS;
WET AND DRY CONSUMERS GAS-METERS, GOVERNORS, &c.

J. & J. BRADDOCK,
GLOBE METER-WORKS,
OLDHAM,

Beg to submit to Gas Engineers their

PATENT COMPENSATING GAS GOVERNOR,

Which is designed to give an uniform pressure at the Outlet to the Main at all draughts up to the full quantities which the Governors are made to control, such outlet pressure being less than the initial pressure.



VERTICAL SECTION

The uniformity of pressure is obtained by introducing a compensating chamber into the Bell or Holder of the Governor, which compensator is of the same area as the valve, both of which are operated on by the initial pressure, thereby placing the valve in equilibrium, no matter what the initial pressure may be. The action on the Bell is by the Gas passing along a pipe from the outlet, and the pressure is regulated by weights in connexion with the Bell as required.

From the sectional elevation attached hereto, it will be seen that only the Gas required to operate the Bell comes in contact with the water of the tank, which water will remain comparatively sweet and free from odour. That in case of accident to the Bell, no more Gas can escape than would pass up the pipe covering the valve-rod and Bell supply-pipe.

These Governors have been made and sent out of various sizes for from 2 to 24-inch Mains, and give most satisfactory results.

They can be made with Float in the Bell, or counterpoise as per section.

J. EDMUNDSON & CO.,

19, GREAT GEORGE STREET, WESTMINSTER, LONDON, S.W.,

MANUFACTURERS OF EVERY DESCRIPTION OF

GAS APPARATUS.

CONTRACTORS FOR THE

ERECTION OF GAS-WORKS, GAS-FITTINGS, &c.,

FOR TOWNS, COUNTRY MANSIONS, &c.

Estimates given free of Charge.

GAS PURIFICATION.

BAILES & HALLSWORTH,

CONTRACTORS FOR THE

PURIFICATION OF COAL GAS,

BY THEIR

PATENT OXIDE OF IRON COMPOUND.

The material is in use at most of the principal Gas-Works in Yorkshire and elsewhere. It contains considerably less moisture than natural Oxide of Iron. It is much cheaper and more efficient as a purifying agent.

B. & H. are purchasers of Spent Oxide, or will take Spent in exchange for New Material.

FOR SAMPLES AND TERMS, ADDRESS—

BAILES & HALLSWORTH, COPPERAS WORKS, ARMLEY, LEEDS.

GEORGE ANDERSON,

GAS AND CONSULTING ENGINEER,

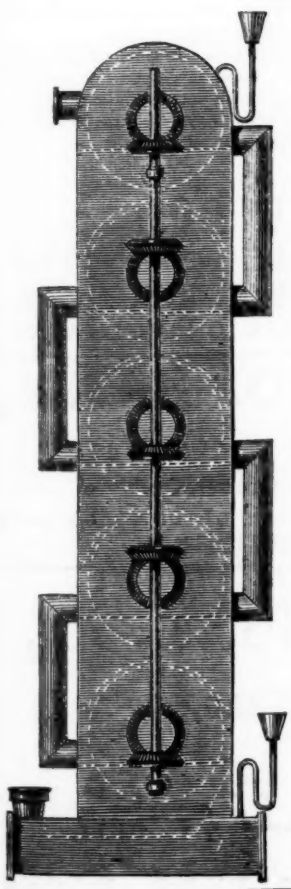
35A, GREAT GEORGE STREET,

WESTMINSTER, S.W.

ANDERSON'S

PATENT

COMBINED WASHER AND SCRUBBER.



TESTIMONY OF ITS ACTION.

The Gas-Works, St. Albans,
April 27, 1877.

DEAR SIR,

Your Brush Scrubber has been in action here for four months.

It removes the whole of the ammonia from the gas, so that it will not discolour moistened turmeric paper.

The brushes cause no appreciable increase of pressure, and there is no repumping of liquor. Clear water run in at top, issues from the bottom fit to proceed to the sulphate-house.

It performs its work more efficiently than the tower scrubber I have, while only about half the height, and not one-fourth its weight or capacity.

My purifiers also last much longer before they are foul than they did previously.

I am, yours truly,

A. F. PHILLIPS.

G. Anderson, Esq.,
35a, Great George Street, S.W.

PATENTEE and MANUFACTURER of the following Inventions:—

RETORT SETTINGS—giving great Economy of Fuel.

STEAM-ENGINES and EXHAUSTERS, FOUR-WAY VALVES.

FUEL-MACHINE, for Compressing Breeze and Tar.

N.B.—Pamphlet, with Eighteen Illustrations and Letterpress on the Construction of Gas-Works, post free, 2s. 6d.

PRICES AND ALL PARTICULARS TO BE HAD OF THE PATENTEE,

35a, GREAT GEORGE STREET, WESTMINSTER, S.W.

PATRONIZED BY THE ROYAL ARSENAL, WOOLWICH.

FERGUSON, Builder and Contractor. Kite method of Repairing Church Spires and High Chimneys. Chimneys straightened, pointed, and hooped. Old Chimneys pulled down by a process requiring no scaffolding or stoppage of work, by competent workmen, under personal supervision. For Lightning Conductors—cheapness and method of fixing—apply to C. E. FERGUSON, 12, Canal Road, MILE END.

HENRY LYON,

ENGINEER,

AND

CONSULTING GAS ENGINEER,

BARTON HOUSE, opposite BARTON ARCADE,

DEANSGATE, MANCHESTER.

THOMAS CARR & SON,

MANUFACTURERS OF

FIRE-BRICKS, LUMPS, TILES, RETORTS, &c., &c.,

SCOTSWOOD FIRE-BRICK WORKS,

SCOTSWOOD-ON-TYNE.

BOUCK & CO., LIMITED,

TAR DISTILLERS & MANUFACTURING CHEMISTS,

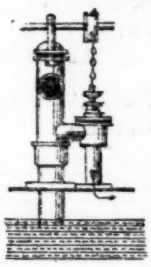
MILES PLATTING, MANCHESTER.

BUYERS OF COAL TAR,

And Crude Products therefrom,

AMMONIACAL LIQUOR, &c.

COPP'S PATENT ANTI-DIP GAS APPARATUS.



Produces from 10 to 20 per cent. more gas of higher illuminating power.
Prevents the deposit of carbon.
Retorts last much longer.
Charges work off quicker.
This simple invention has been in use in many works for the last six months, with the above results.

PRICE 2 GUINEAS EACH.

Testimonials and particulars on application.

Address **WALTER L. COPP,** WATCHET, SOMERSET.

WILSON'S

PATENT SAFETY PRESSURELESS

AUTOMATIC DIP-PIPES,

Fixed or moveable, adapted to works of any size, without other alteration than removal of existing Dips.

W. P. WILSON, 98, ASYLUM ROAD, S.E.

PATENT FUEL AND LIME FOR PURIFYING FROM FOUL LIME.

By a simple process the Foul Lime is converted into Fuel, by the combustion of which the lime is reproduced as a purifying agent.

Licences to work the invention will be granted to Gas Companies on very reasonable terms.

For further particulars apply to Mr. E. MADDOCKS, Manager of the Gas-Works, KETTERING.

The adoption of the above invention, without a licence from the Patentee, will be an infringement of the patent, and will subject the person or company guilty of such infringement to legal process.

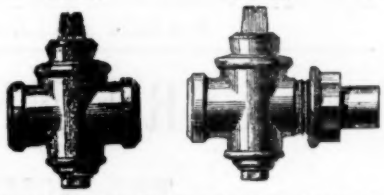
LAMBERT'S

CAST-IRON GAS-MAIN COCKS,

WITH PATENT WHITE METAL PLUGS.

TRADE (L) MARK.

No. 758. No. 759.



The bodies of these Taps are made of iron, black or galvanized, and the plugs of patent metal. They are warranted not to set fast or corrode, as do Iron or Brass Cocks; will always work easily; are strong, well made, durable; of little or no intrinsic value, and therefore not likely to be stolen; and the prices as stated below are (especially upon the larger sizes) fully 50 per cent. less than Brass Cocks.

	½	¾	1	1¼	1½	2-inch.
No. 758, with inside screws for iron pipe, black	2/0	3/0	4/4	6/6	7/6	12/0 each.
No. 759, with union on one end screwed inside for iron pipe, black	2/9	3/10	5/4	8/0	9/0	15/6 each.
Nos. 758 and 759, galvanized	0/3	0/4	0/6	0/8	0/10	1/4 extra.

MANUFACTORY:

SHORT STREET, LAMBETH, LONDON.

ALFRED LASS,

SPECIAL ACCOUNTANT FOR GAS COMPANIES,
30, GRACECHURCH STREET, LONDON.

Accounts analyzed and Statistics Prepared for Parliamentary Proceedings, Arbitrations, &c.

The Forms of Account, which have been specially designed by A. L. to meet the requirements of the Gas-Works Clauses Amendment Act, 1871, are now in use by many Gas Companies, and have been universally approved.

The above forms are registered.

Water Companies Accounts also prepared and adjusted.

CONSULTATIONS.

ADDISON POTTER,

WILLINGTON QUAY,
NEAR NEWCASTLE-UPON-TYNE,
Manufacturer of
CLAY RETORTS, FIRE-BRICKS, AND EVERY DESCRIPTION OF FIRE-CLAY GOODS

YEO'S PATENT ENGINE PACKING AND IMPROVED YARN FOR GAS AND WATER PIPE JOINTS.

EPHRAIM YEO, Inventor, Patentee, and Sole Manufacturer of the Patent Excelsior Self-Lubricating Rope Engine Packing, price 1s. 8d. per lb., any size. Carriage paid on ½cwt. and upwards to any Railway Station in the Kingdom. Best Tarred Spun-Yarn for Gas-Pipe Joints, 38s. per cwt. Best White Ditto, any size, 36s. per cwt. Best Ditto, boiled in Oil and Tallow, 36s. per cwt. Coke Sacks, any length or width, Tarred or Untarred. Carriage paid to any Railway Station in the Kingdom. Address—

E. YEO, NEWTON ABBOT, DEVONSHIRE.

JOHN ROMANS, C.E., F.G.S.E.,

CONSULTING GAS ENGINEER
AND
CANNEL COAL FACTOR,
30, St. Andrew Square, EDINBURGH.

Plans and Estimates furnished; Gas-Works, Apparatus, Pipes, Machinery, Fire Goods, &c., supplied, or Attested and Shipped for Exportation.

GAS-WORKS TAKEN ON LEASE.

Mr. ROMANS has for upwards of 30 years been practically engaged in the Manufacture of Gas, and has, by extensive experiments, ascertained that by JUDICIOUS INTERMIXTURE of the lighter with the heavier gases, much of the rich Hydrocarbons CAN BE SAVED, which otherwise ARE LOST, during the process of manufacture. He is therefore enabled to give advice to those who favour him with their orders for Cannel, as to the class which will secure for their standard of illuminating power the HIGHEST ADVANTAGEOUS RESULTS.

ANALYSIS AND PRICES FORWARDED ON APPLICATION.

HEBBURN MAIN GAS COALS.

T. Stone, Esq., of Weymouth, writes on Nov. 17, 1876: "I have used about 12,000 tons of this Coal, with, I think, the best possible results, although not always under the most favourable circumstances. My Coal account made up to Midsummer last showed a makeage of 10,524 cubic feet per ton of 14½-candle gas, and not a hundredweight of Cannel used. This statement would, I know, be incredible to many men, and may provoke the remark, 'How much of it is paid for?' For the gratification of such, I have to say that, of the above quantity, 9866 cubic feet per ton of Coal carbonized were brought to charge and duly paid for, with the exception of about 6s. per cent. for bad debts. The coke is of excellent quality. The above facts I hold to be a greater recommendation to your Coal than any words of mine could be."

THE TYNE COAL COMPANY, LIMITED, OWNERS.
W. RICHARDSON, Fitter,
29, QUAYSIDE, NEWCASTLE-ON-TYNE.

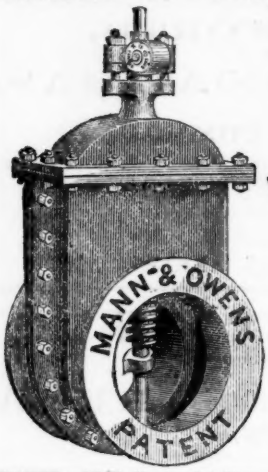
JOHN HALL AND CO., STOURBRIDGE,

Manufacturers of FIRE-BRICKS, LUMPS, TILES,

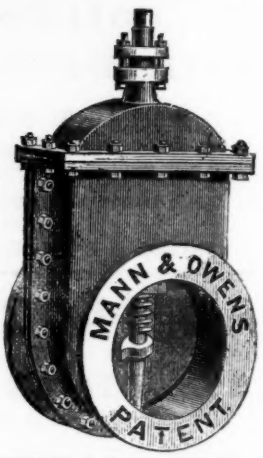
AND EVERY DESCRIPTION OF FIRE-CLAY GOODS.

N.B.—A Stock of 15 and 16 in. CIRCULAR RETORTS always on hand. Other kinds made to order on short Notice.

MANN & OWENS' PATENT GAS-VALVE.



EVERY VALVE WARRANTED TO BE PERFECTLY SOUND AND GAS-TIGHT.



VALVE, with Indicator for Above Ground. UNDERGROUND VALVE.

The advantages of this Patent Valve over all others yet introduced are, that it is always as tight as the best wedge or spring valve, without the possibility of setting fast or becoming suddenly leaky. The surfaces not being in contact during the operation of opening or closing, leakage through wear and tear is avoided.

The Gas Engineer will not fail to see the importance of such a valve in connexion with his purifying apparatus, particularly in the case of large sizes.

The slide being operated either by a screw and nut, or by a pinion and rack, a cam bearing upon a plane, cast on the back of the Valve, forces it against the face, and renders the escape of gas an impossibility. By a slight turn of the pinion or screw, the slide is released, and brought away from the face, by which means friction is avoided, and the only force required to open the Valve is that due to its own weight.

SOLE MANUFACTURERS:

S. OWENS AND CO.,

HYDRAULIC AND GENERAL ENGINEERS,
WHITEFRIARS STREET, LONDON, E.C.
PRICES, SIZES, AND FULL PARTICULARS ON APPLICATION.

THE WIGAN COAL & IRON COMPANY,

LIMITED.

DISTRICT OFFICE: 97, NEW STREET, BIRMINGHAM; AGENT: W. M'GOWAN;

Supply the Best Wigan Arley Mine Gas Coal, Gas Nuts, Gas Cannel, &c.

N.B.—The Wigan Coal and Iron Company, Limited, are exclusive owners of the well-known HAIGH HALL AND KIRKLESS HALL GAS COAL COLLIERIES.

MESSRS. NEWTON, CHAMBERS, & CO.,

THORNCLIFFE IRON-WORKS, NEAR SHEFFIELD,

MANUFACTURERS OF

IMPROVED CENTRE-VALVES,

PURIFIERS, CONDENSERS, SCRUBBERS, GASHOLDERS, ROOFS,

And every description of Gas Machinery.

TENDERS GIVEN FOR WORK FIXED COMPLETE IN ANY PART OF THE KINGDOM.

W. & B. COWAN,

ORIGINAL LICENSEES AND MANUFACTURERS OF

WARNER & COWAN'S SELF-REGULATING GAS-METER

(THE ONLY METER SUITABLE FOR TROPICAL CLIMATES.)

NO reliance can be placed in Meters with chambers of a varying measuring capacity, supplemented by delicate and complex arrangements to cover the irremovable defects in the principle of construction.

But reliance CAN be placed in the

WARNER & COWAN METER,

As it is the ONLY ONE that has a measuring chamber of UNVARYING CAPACITY.

W. & B. COWAN,

WET & DRY GAS-METER MANUFACTURERS,

(ESTABLISHED 1827,)

CHURCH STREET,
MILLBANK STREET,
LONDON, S.W.

FENNEL STREET,
MANCHESTER.

BUCCLEUCH ST. WORKS,
EDINBURGH.

WILLIAM SUGG,

GAS ENGINEER,

VINCENT WORKS, VINCENT STREET,

WESTMINSTER, S.W.

"EVANS"

PHOTOMETERS,

Which DO NOT REQUIRE A DARK ROOM, with Fittings and Bench complete, as approved by the

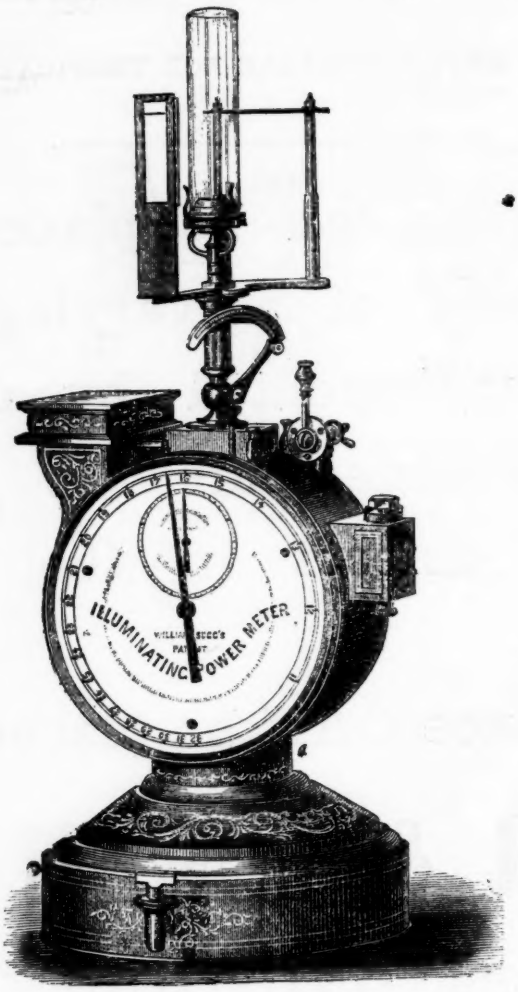
GAS REFEREES.

LOWE'S

Jet Photometers

(KIRKHAM & SUGG'S IMPROVED),

With all the most recent additions.



"LETHEBY"

PHOTOMETERS,

With Fittings and Bench complete for DARK ROOM, as approved by the

GAS REFEREES.

THE "LONDON"

Standard Burner,

"GAS REFEREES MODEL,"

For 14 and 16 candle Gas.

"GAS REFEREES"

PRESSURE-GAUGES.

"GAS REFEREES"

SULPHUR & AMMONIA

TESTS,

With all the accessories.

WILLIAM SUGG'S

PATENT

ILLUMINATING POWER METER,

For showing the Illuminating Power of Gas in Parliamentary Sperm Candles, by the observation of one minute.

PRICE £26 10s. COMPLETE.

The above Meter is now in use in London and several large towns in England, Scotland, and Ireland; also in America and Australia. The results, as reported to the present time, have given great satisfaction.

Price Lists and further Information on application to above Address.

EDWARD COCKEY & SONS,

GAS ENGINEERS, FROME SELWOOD,

MANUFACTURERS OF ALL DESCRIPTIONS OF

APPARATUS CONNECTED WITH GAS-WORKS.

THE ORIGINAL PATENTEES AND MANUFACTURERS OF THE

DRY-FACED VALVES

FOR PURIFIERS, GASHOLDERS, BYE-PASS, AND OTHER ARRANGEMENTS REQUIRING VALVES IN GAS-WORKS.

The Faced Valves, as made by the Patentees, continue to give great satisfaction, and they are being used extensively by many of the best gas engineers of the day.

They are more easily repaired than any other kind of Valve in use, and can be re-ground in a few hours without removal, and made perfectly gas-tight.

References can be given to many Engineers of high standing, who will testify as to the favour in which they are held.

MANUFACTURERS ALSO OF SUPERIOR WOOD GRIDS FOR PURIFIERS, SCRUBBERS, &c.

GEORGE WALLER & CO.,

GAS ENGINEERS AND CONTRACTORS,

MANUFACTURERS OF

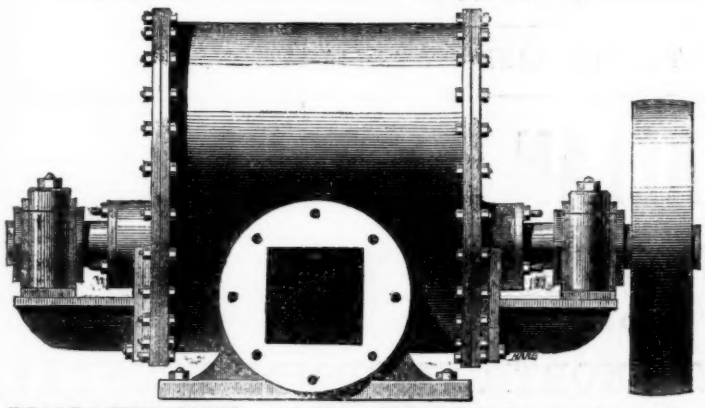
BEALE'S IMPROVED PATENT GAS EXHAUSTERS,

COMBINED ENGINES AND EXHAUSTERS,

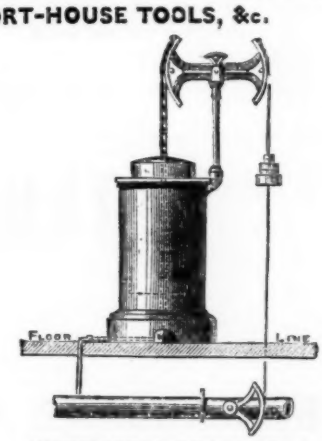
IMPROVED HYDRAULIC REGULATORS, TAR AND LIQUOR PUMPS,

SCRUBBERS, PURIFIERS AND CONDENSERS, HYDRAULIC AND STEAM LIFTS FOR COAL AND OXIDE,

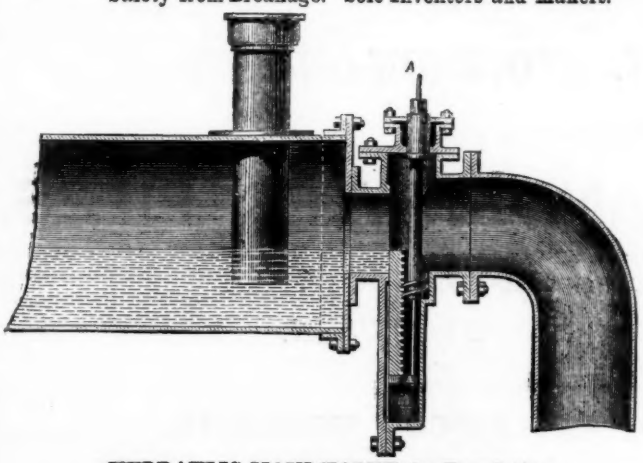
BOILERS, ROOFS, COLUMNS, GIRDERS, PURIFIER TRAVELLERS, RETORT-HOUSE TOOLS, &c.



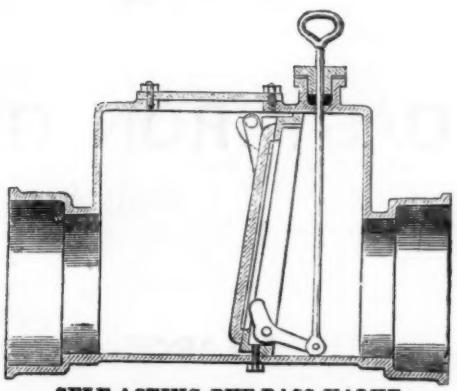
BEALE'S EXHAUSTER, with Wrought-Iron Spindle, ensuring perfect Safety from Breakage. Sole Inventors and Makers.



HYDRAULIC REGULATOR.



HYDRAULIC MAIN VALVE for Regulating Seal of Dip-Pipes.



SELF-ACTING BYE-PASS VALVE, with Relieving Lever.

EXHAUSTERS, VALVES, PUMPS, ENGINES, &c., ALWAYS KEPT IN STOCK.

PHŒNIX ENGINEERING WORKS, HOLLAND STREET, SOUTHWARK, S.E.

JOHN ABBOT AND CO.,

LIMITED,

IRON AND BRASS FOUNDERS,

PARK WORKS, GATESHEAD-ON-TYNE.

London Office: 2, SUFFOLK LANE, CANNON STREET.

Glasgow Office: 54, ST. ENOCH'S SQUARE.

MANUFACTURERS OF ALL DESCRIPTIONS OF

HYDRAULIC MACHINERY,

INCLUDING

ACCUMULATORS, FORCE-PUMPS, CRANES, & LIFTS,

FOR

GAS-WORKS, WAREHOUSES, &c.

IMPROVED HYDRAULIC MACHINERY,

Specially Arranged for Lifting and Lowering Purifier-Covers, &c.

MAKERS OF

PURIFIERS, CONDENSERS, SCRUBBERS, RETORTS;

PIPES FOR GAS AND WATER WORKS;

ROOFS, COLUMNS, AND GIRDERS.

DESIGNS AND ESTIMATES SUPPLIED ON APPLICATION.

THOMAS ALLAN & SONS,

IRONFOUNDERS,

WORKS:

SPRINGBANK FOUNDRY & NORTH WOODSIDE FOUNDRY,

GLASGOW;

BONLEA FOUNDRY, STOCKTON-ON-TEES,

Manufacturers of

CAST-IRON GAS AND WATER PIPES.

SIZES: ¾ to 12 inches at GLASGOW.

„ 1½ to 7 „ STOCKTON.

A LARGE STOCK KEPT, AND PRICES MODERATE.

Freight to London, in the Stream, 10s. per ton from Stockton; 12s. 6d. from Glasgow.

London Agent: Mr. A. C. FRASER, ST. STEPHEN'S CHAMBERS, TELEGRAPH STREET.

THE FARNLEY IRON COMPANY, LIMITED,

FARNLEY, near LEEDS,

MANUFACTURERS OF

FIRE-CLAY GAS-RETORTS & FIRE-BRICKS,

Of every size and shape, and of the best quality; also of White and Coloured GLAZED BRICKS, SANITARY PIPES, &c., &c.

In order to meet the constantly increasing demand for their Gas-Retorts, the F. I. Co. have recently made such an addition to their premises as will enable them to execute expeditiously the largest home or foreign orders.

London Agent for Gas-Retorts: D. W. OGG, 3, Jeffrey's Square, St. Mary's Axe, E.C.

" " Glazed Bricks: A. BARFIELD, 22, Great George Street, Westminster.

LIVESEY FIRE-CLAY WORKS.

NEAR BLACKBURN, LANCASHIRE.

(ESTABLISHED 1835.)

ORLANDO BROTHERS, LIMITED,

MANUFACTURERS OF PATENT CLAY RETORTS,

AND EVERY DESCRIPTION OF

TUBULAR GLAZED SEWERAGE PIPES, BENDS, JUNCTIONS, ETC.

FIRE-BRICKS, TILES, BLOCKS, AND CHIMNEY-TOPS

GAS PURIFICATION & CHEMICAL Co., LIMITED.

(Successors to JOHN WILLIAM O'NEILL & CO.,)

Offices—PALMERSTON BUILDINGS, OLD BROAD STREET, LONDON, E.C.,

CONTRACTORS FOR GAS PURIFICATION BY OXIDE OF IRON.

The superiority of the material supplied by this Company is generally recognized, and it is now in use in nearly all the London and most of the large Provincial Gas-Works.

JOHN WILLIAM O'NEILL, SAMUEL H. JOHNSON. } Joint Managing Directors.

HENRY GREENE & SON,

GAS AND HOT WATER ENGINEERS,

155, CANNON STREET, E.C.

Manufactory: 19 & 20, NICHOLAS LANE, E.C.

SUN-BURNERS,

With Regulating Valves to obviate down draught.

MEDIÆVAL & OTHER GAS-FITTINGS

For Churches and Domestic Use.

ARCHITECTS' OWN DESIGNS WORKED OUT.

ESTIMATES FREE OF CHARGE.

THE TRADE SUPPLIED.

SOLE CONSIGNEES FOR BRÖNNER'S IMPROVEMENTS IN GAS LIGHTING.

IN THE MATTER OF

BRÖNNER'S GAS-BURNERS.

HENRY GREENE AND SON, 155, Cannon Street, London, Sole Agents for Great Britain, Ireland, and Colonies, of Brönner's Improvements in Gas Lighting, beg to inform the public that on the 13th of January, 1876, Julius Brönner obtained an injunction in the Court of Session, Scotland, against Donald M'Vean, Gas-Fitter, 14, Newton Street, Glasgow, prohibiting him from in any way advertising or offering for sale as Brönner's Burners, any Burner not manufactured by Julius Brönner, or from in any way inducing the public to believe that the said Donald M'Vean sells or keeps for sale Brönner's Burners, manufactured by Julius Brönner, while such is not the case.

Also that on the 9th of November, 1875, he obtained injunction in the same Court, and in the same terms, against R. M. Brechin and Co., 46, North Hanover Street, Edinburgh.

Also that on the 20th of April, 1875, in a suit in Chancery, before Vice-Chancellor Malins, number 1874, B 365, he obtained injunction against another defendant, in the same terms and on similar grounds.

WEST'S GAS IMPROVEMENT COMPANY,

LIMITED,

ARE NOW PREPARED TO SUPPLY AND ERECT THEIR PATENTED MACHINERY FOR

CHARGING AND DRAWING GAS-RETORTS,

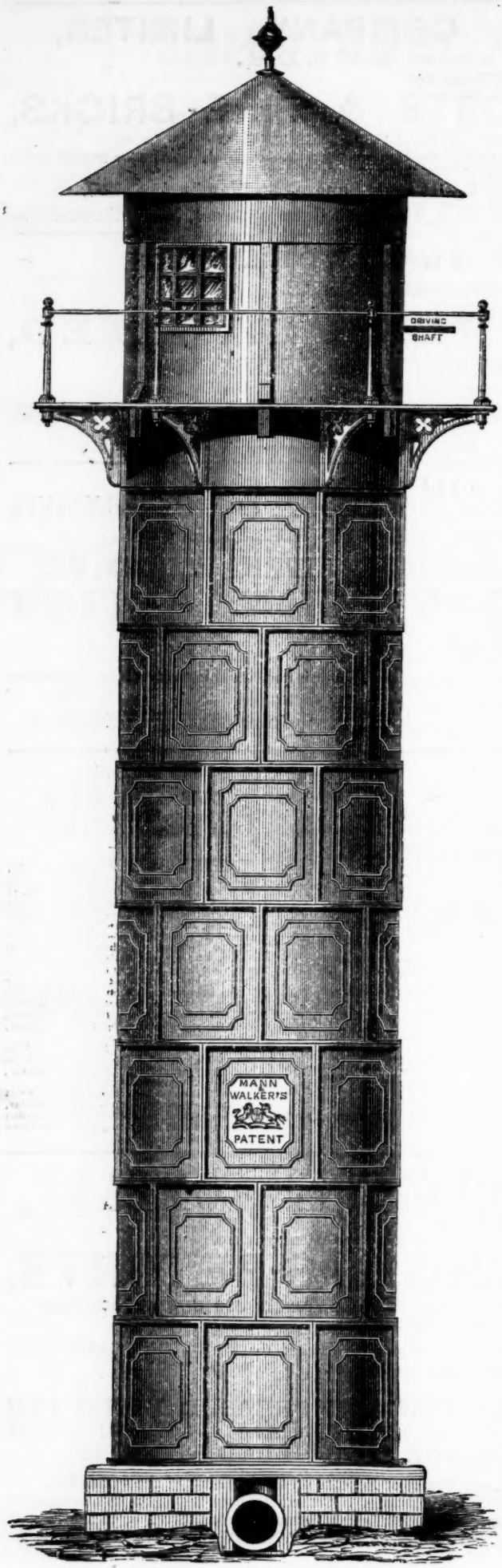
And to enter into arrangements with GAS COMPANIES for its use upon moderate terms of Royalty.

The Patented Machinery has secured the approbation of all Engineers who have visited the MAIDSTONE GAS-WORKS, *where it is in full operation, and may be inspected at any time on application to the Manager.*

The advantages attending its use are—

INCREASED VOLUME OF GAS PER TON.—INCREASED YIELD PER RETORT.—INCREASED BULK OF COKE FOR SALE.—REDUCTION IN LABOUR AND LESS DEPENDENCE ON SKILLED STOKERS.

A Pamphlet containing a description of the Machinery, and Copies of Reports on the working of the same, &c., will be forwarded on application to the MANAGING DIRECTOR, Maidstone. Communications may also be addressed to the Consulting Engineer, R. P. SPICE, Esq., M. Inst. C.E., 21, Parliament Street, London, S.W., or to the Engineer and Analyst, F. W. HARTLEY, Esq., A. Inst. C.E., 55, Millbank Street, London, S.W.



C. & W. WALKER,
8, Finsbury Circus,
London, E.C.

MANN & WALKERS' PATENT SCRUBBER.

By Letters Patent in Great Britain, Europe, and the United States of America.

By some important improvements recently patented, the purifying power of these Scrubbers has been much increased, and a stronger ammoniacal solution obtained, which is found to absorb a large portion of the carbonic acid contained in gas, effecting an important saving in money and labour in the lime purifiers, and where oxide only is used, the increase in the illuminating power of the gas obtained by these Scrubbers is shown in a remarkable degree, in consequence of the large quantity of carbonic acid removed from the gas.

It is to be particularly noted that the important results of these Scrubbers do not depend upon the machinery alone. The entire internal construction of the Scrubber bears an almost equally important part. For this reason, where it is desirable to convert existing Scrubbers, whose dimensions happen to be suitable, the work commences by ripping out the whole of the interior of the shell, and beginning the internal construction *de novo* from bottom to top.

They are, in all cases, constructed under guarantees to perfectly perform their work. They are now extensively used in the largest gas-works of London and the chief cities of Europe, the number in use exceeds **one hundred,** and their perfect efficiency and profit to a gas company have been fully established with every variety of coal used in Europe. References can be given to the largest gas-works in Europe.

By their use the department of purification from ammonia upon a gas-works is made complete, without the aid of prepared oxide of iron, chemicals in purifiers, or any other supplementary process, and the whole ammoniacal residual product contained in the coal is absorbed and obtained in the form most profitable to a gas company, while the requirements of all Acts of Parliament and of the Board of Trade, relating to incorporate gas companies, are satisfied.

Foul Gas, properly condensed, entering the inlet is, by once only passing through the Scrubber, completely purified from ammonia with regular certainty day by day, without any further trouble, or any other process, effected by a very small quantity of clear water let into the machinery room at the top of the Scrubber, which is discharged at the liquor outlet at the bottom, from Newcastle coal at about 18 to 20 ounces strength, from Yorkshire and other coals, generally from 25 to 30 ounces strength; while acidulated litmus or turmeric exposed at the Scrubber outlet will not show the slightest discoloration, and there is not a quarter of a grain of ammonia per 100 feet left unabsorbed.

They contain their own engine power, requiring only a small inappreciable quantity of steam from the gas-works boiler, and are then complete in themselves, ready for service.

Applications relating to dimensions and prices should be addressed to us, C. and W. Walker, 8, Finsbury Circus, London, E.C., or to Mr. William Mann, late Superintendent of the Chartered Gas-Works, Blackfriars, London; they should state approximately the largest make of gas in 24 hours on a winter's day, and the smallest make on a summer's day, to be purified.

F. & C. OSLER,

45, OXFORD STREET, LONDON, W.

MANUFACTORY AND SHOW-ROOMS:

BROAD STREET, BIRMINGHAM.

ESTABLISHED 1807.

MANUFACTURERS OF CRYSTAL GLASS CHANDELIERS

WALL LIGHTS, AND LUSTRES FOR GAS AND CANDLES.

TABLE GLASS OF ALL KINDS.

CHANDELIERS IN BRONZE AND ORMOLU. MODERATOR LAMPS.

TO GAS COMPANIES AND THE TRADE.

J. DEFRIES & SONS,

MANUFACTURERS OF

CRYSTAL, BRONZED, & ORMOLU CHANDELIERS, IMPROVED CRYSTAL STAR & SUN LIGHTS, VESTIBULE LAMPS, AND THE PATENT CRYSTAL ILLUMINATION.

A LARGE STOCK ALWAYS IN HAND OF

IRON, BRASS, COMPOSITE, AND LEAD TUBES, FOR GAS AND WATER,

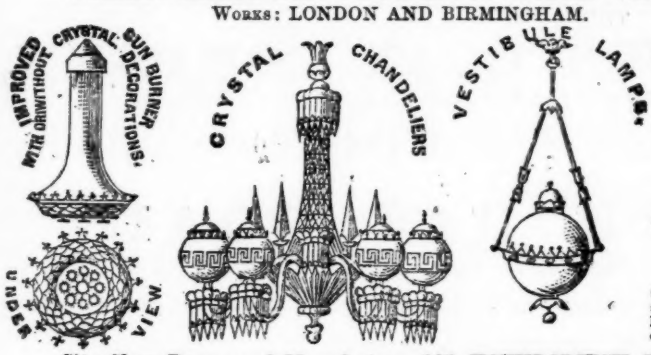
AND EVERY DESCRIPTION OF

GAS AND WATER FITTINGS.

THE PATENT DRY AND WET METER, WITH THE LATEST IMPROVEMENTS.

STREET LAMPS AND COLUMNS IN GREAT VARIETY.

WORKS: LONDON AND BIRMINGHAM.



GAS MOONS, Cut and Engraved, of the newest designs

GAS REFLECTORS In Silver and Glass

GAS NIBS AND **BURNERS** Of every description.

Pattern-Books of Gas-Fittings, Crystal and Ormolu Chandeliers for 1876, are now complete.

City Show-Rooms and Manufactory, 147, HOUNDSDITCH, LONDON.

ESTABLISHED 1830.

LESMAHAGOW CANNEL COAL.

FERRAND DAVIES,

148, GRESHAM HOUSE, OLD BROAD STREET, LONDON, E.C.,

SOLE AGENT FOR

THOMAS BARR'S LESMAHAGOW MAIN CANNEL.

Quotation and Analysis forwarded on application.

G. J. EVESON,

GAS COAL AND CANNEL FACTOR,

Has on offer, in quantities to suit purchasers, Best Wigan Arley Mine, Orrell Screened and Unscreened Gas Coal and Nuts; Best Yorkshire, Real Old Silkstone, Derbyshire, and North Staffordshire Screened and Unscreened Gas Coal and Nuts; also Best Lancashire, Yorkshire, Derbyshire, and other Cannel, as supplied to some of the principal Gas Companies in England, to whom references are permitted.

Analysis and Prices forwarded on application to

HEAD OFFICES, STOURBRIDGE.

N.B.—Gas Managers will oblige by advising when they will be prepared to receive Tenders.

STOURBRIDGE FIRE-BRICKS, RETORTS, CLAY, &c.

ROBERT MARSHALL,

CANNEL COAL MERCHANT,

173, ST. VINCENT STREET, GLASGOW.

SHOTT'S BOGHEAD.

LOTHIAN'S CANNEL

Yields 12,500 cubic feet of 34-candle gas per ton, and 9 cwts. of excellent coke, containing only 4 per cent. of ash.

MUIRKIRK, No. 1, CANNEL.

Yields 12,160 cubic feet of 32·5-candle gas per ton, and 10 cwts. of excellent coke, containing only 5 per cent. of ash.

OLD WEMYSS CANNEL

Yields 13,320 cubic feet of 32·5-candle gas per ton.

Prices and full Analyses on application.

GAS COAL.

POPE & PEARSON, LIMITED, have now the authority of several of the most eminent Gas Engineers of London in stating that their Coal yields *in practical working over* 10,000 *cubic feet of gas, with an illuminating power of* 16 *candles;* or by the standard burners now used by the London Gas Companies, an illuminating power equal to 17½ candles.

One ton yields 12½ cwt. of good coke. This Coal can be shipped from Hull, Goole, Liverpool, Morecambe, and Barrow.

For further particulars, apply to POPE AND PEARSON, LIMITED, West Riding and Silkstone Collieries, near LEEDS.

SCOTCH CANNEL COALS.

The Subscriber is prepared to contract for the supply of all the principal SCOTCH CANNEL COALS. Prices and Analyses of the various Coals will be forwarded on application.

JAMES M'KELVIE,

CANNEL COAL MERCHANT,

HAYMARKET, EDINBURGH.

Established 1840.

WILSON CARTER & PEARSON,

GAS COAL AND CANNEL FACTORS,

Supply to any Railway Station or export Best Wigan Arley Gas Coal and Nuts; best qualities of the Derbyshire, Yorkshire, and North Staffordshire Gas Coals and Nuts; also the best descriptions of Lancashire, Welsh, Scotch, and other Cannel.

Messrs. WILSON CARTER & PEARSON, being contractors to several of the principal Gas Companies in the Midland Counties, have pleasure in being enabled to give them as references.

Chief Offices: Temple Buildings, 50, New Street, Birmingham.

London Offices: 6, Great Winchester St. Buildings, E.C.

GRIRDROD'S PATENT

PORTABLE PIPE SCREWING MACHINE,

For 1 in., 1¼ in., 1½ in., and 2 in. Gas Threads, complete £7 10s.

In use at the chief gas-works, and giving great satisfaction.

For other useful goods, see Bailey's "Illustrated Inventions," post free 3s. 6d.; gratis to ledger customers.

W. H. BAILEY & CO.,

Brassfounders, Gauge Injector and Tool Makers,

ALBION WORKS, SALFORD, LANCASHIRE.

ALBERT GAS COAL.

THE DERBYSHIRE

SILKSTONE COAL COMPANY,

LIMITED,

CAN OFFER A

GAS COAL

Of superior quality, delivered in trucks at any Railway Station in England, or shipped on board at Hull, Grimsby Docks, or Barrow-in-Furness.

Purified gas per ton of coal in cubic feet (average)	**10,262**
Illuminating power in candles	**15·86**
Weight of coke in lbs. per ton of coal	**1,502**

ANALYSIS AND PRICES ON APPLICATION TO

Mr. EDMUND TAYLOR, Secretary,

ALBERT COLLIERY, NEWBOLD, NEAR CHESTERFIELD.

THE SILKSTONE & DODWORTH COAL & IRON COMPANY, LIMITED,

DODWORTH, BARNSLEY.

BENJAMIN WHITWORTH, Esq., M.P. . . . . Chairman.
Mr. RICHARD HARTLEY . . . . . Managing Director.

REAL OLD SILKSTONE GAS COAL.

JAMES PATERSON, Esq., Gas Engineer, of the Warrington Gas Company, reported, Aug. 10, 1875:—

"This Coal possesses remarkable qualities as a gas and coking coal, and appears SECOND TO NONE IN THE KINGDOM. It contains the large quantity of 699 lbs. of illuminating matter, and 1498 lbs. of coke to the ton, and produces **12,240** cubic feet of 16·66 candle gas."

The above Company are raising nearly a thousand tons of the Real Old Silkstone Gas Coal per working day.

PRICES QUOTED TO ANY RAILWAY STATION, OR F.O.B. HULL, GRIMSBY, GOOLE, KEADBY, LIVERPOOL, AND FLEETWOOD.

THE

WIGAN & WHISTON COAL COMPANY,

LIMITED,

(COLLIERIES—PRESCOT, NEAR LIVERPOOL)

Are now prepared to supply their

RUSHY PARK GAS COAL,

Either to Gas-Works in England or Wales, or for Shipment, at Runcorn, Garston, Birkenhead, or Liverpool.

This Coal is of superior quality, and yields in practical working over 10,000 cubic feet of Purified Gas per ton, with an Illuminating Power of 17½ candles.

One Ton of Coal yields 1441 lbs. of good Coke.

For prices, &c., apply either direct to the Colliery or to the Company's Office,

195, FALKNER STREET, LIVERPOOL.

SILKSTONE GAS COAL

AND

LANCASHIRE AND MIDLAND CANNEL.

EMOR G. WRIGLEY, Merchant,

Having made arrangements with four large Collieries for the exclusive sale of their GAS COAL and CANNEL, can offer to Gas Companies large quantities, for delivery over one or two years, at exceedingly low prices. His REAL OLD SILKSTONE GAS COAL will give, in regular work, 10,200 feet 16·6 candle gas and 13 cwt. superior coke; and a WIGAN CANNEL 11,375 feet 21·75 candle gas and 12 cwt. superior coke.

PRICES AND ANALYSIS WILL BE FORWARDED TO ANY PART ON APPLICATION TO THE CHIEF OFFICE,

120a, STAMFORD STREET, ASHTON-UNDER-LYNE.

1862.

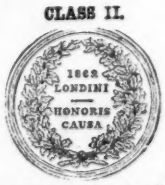
PATENT ANTIMONY PAINT.

MADE ONLY BY

GEORGE HALLETT & CO.,

296, ROTHERHITHE, LONDON, S.E.

CLASS II.



This Paint having been in general use over fifteen years (especially in some of the principal Gas-Works), and proved itself the best light-coloured Paint produced for resisting the influence of vitiated atmospheres, it is important that its qualities should be more widely known.

It is not discoloured like white lead in a sulphuretted atmosphere, nor washed off like white zinc; and its light colour reflecting heat, produces much less expansion of gas in holders painted with it than with dark colours, besides rendering them much more sightly. Its specific gravity is so much below white lead that the same weight will cover one-third more surface, while it is equal in body; and its price being about the same (30s. per cwt.), it is actually one-third cheaper. From experience, its manufacture is greatly improved, and it is quite suitable for all purposes in which white lead is employed.

The following Gas Companies in London have used the Paint for years—viz., The Gaslight and Coke, Imperial, Independent, City of London, Commercial, London, and Surrey Consumers.

N.B.—Antimony Paint, COVERING SO MUCH MORE WORK, costs about 20s. per cwt., as compared with White Lead at 30s. per cwt.; a similar economy arises from its use in Steam and Gas Joints, for which purpose it is superior to White Lead.

SPECIAL DRIERS FOR ANTIMONY PAINT SUPPLIED.

NEWTON, CHAMBERS, & CO.,

THORNCLIFFE IRON-WORKS AND COLLIERIES,

NEAR SHEFFIELD.

CELEBRATED SILKSTONE GAS COALS.

The various descriptions of Gas Coal produced from the above Collieries possess an unequalled reputation, combining in a large degree the constituents essential for the production of the best quality of Coke and Gas of a high illuminating power.

A recent extensive development of the Collieries enables us to offer increased supplies.

JAS. PATERSON, Esq., of Warrington, after testing various qualities of our Coal, has sent the following testimony of their merits:—

Warrington Gaslight and Coke Company,
Offices, Mersey Street, Warrington, April 23, 1877.

Messrs. NEWTON, CHAMBERS, AND CO.,

Gentlemen,

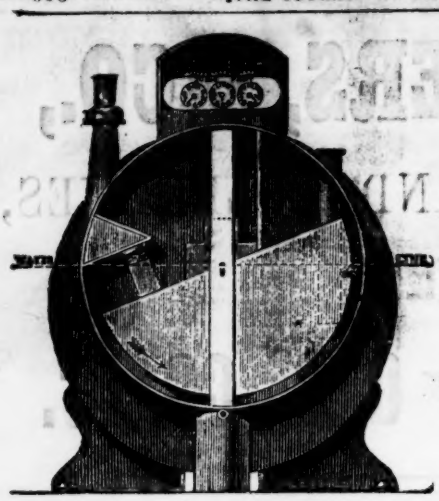
After carefully testing the various samples of Gas Coals sent from your Collieries for analysis, I have pleasure in reporting them as belonging to the highest class of Gas and Coking Coals.

The average of Nine samples gives a yield of 12,500 cubic feet of 15½ Candle Gas, being equivalent to 664 lbs. of sperm per ton, and 1420 lbs. of fixed carbon of a very superior quality. All the samples bear a close relation to each other in value.

Yours truly,

JAMES PATERSON.

Full particulars will be sent on application to us—address as above.



THE

UNVARYING WATER-LINE GAS-METER.

(SANDERS AND DONOVAN'S PATENT.)

"Unquestionably the best Water Gas-Meter now in use."—THOS. G. BARLOW, C.E.

Over 120,000 in action.

MANUFACTURERS:

THE GAS-METER COMPANY, LIMITED,

KINGSLAND ROAD, LONDON;

WITH

Branch Manufactories at DUBLIN and OLDHAM.

HARRIS & PEARSON,

FIRE-CLAY AND BRICK WORKS, STOURBRIDGE.

GAS-RETORTS, LUMPS, TILES, & FIRE-BRICKS,

OF EVERY DESCRIPTION.

A LARGE ASSORTMENT OF GAS-RETORTS IN STOCK.

STOCK FOR EXPORT READY AT THE WORKS, AND AT ELLESMERE PORT.

R. LAIDLAW AND SON,

EDINBURGH AND GLASGOW.

SOLE MAKERS OF

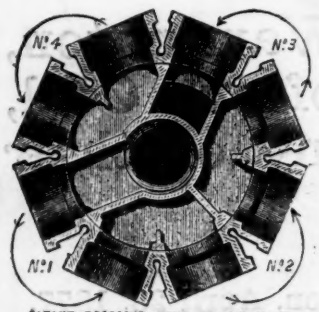
PATENT

RECESSED CONE CENTRE-VALVES,

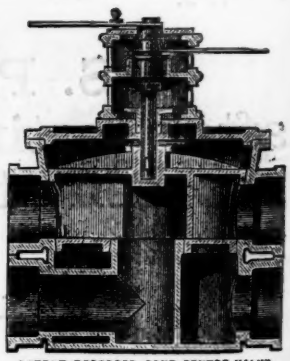
Constructed on the principle of the ordinary Plug-Cock.

THROUGH-WAY & FOUR-WAY COCKS

Of all descriptions.



PATENT RECESSED CONE CENTRE-VALVE.
Sectional Plan.



PATENT RECESSED CONE CENTRE-VALVE.
Sectional Elevation.

LONDON OFFICE: 106, CANNON STREET.

D. HULETT & CO.

Invite the attention of Gas Companies, Corporations, and others to their

PATENT STREET LAMPS,

Which are so constructed that neither putty nor other materials are required to secure the glass. No hacking out of old putty, which frequently destroys the frames. A new pane of glass can be inserted in two or three minutes by any inexperienced person, the glass being secured by a hinged flap and turn button.

PRICE 10s. each, net. Special quotations for large quantities.
Also made EXTRA STOUT recommended for its durability, PRICE 11s. 6d. each.

D. HULETT'S IMPROVED SERVICE CLEANSER,

By the use of which stoppages in service and other pipes are freed from naphthaline and other obstructions in a few minutes. PRICE 73s. net.

HULETT'S PATENT MERCURIAL REGULATOR,

For inserting in mains, to prevent the excess of pressure in high ground, or other elevated positions.

PATENTEES OF IMPROVED WET AND DRY GAS-METERS.

Makers of all kinds of Pressure-Gauges, Gaseliers, and every kind of Gas-Fittings for the Trade.

GAS HEATING AND COOKING STOVES.

55 and 56, HIGH HOLBORN, LONDON.

London: Printed by WILLIAM BOUGHTON KING (at the office of Clayton and Co. 17, Bouverie Street, Fleet Street); and published by him at No. 11, Bolt Court, Fleet Street, in the City of London.—Tuesday, June 19, 1877.